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Behind the Seawall

Historical Archaeology Along the San Francisco Waterfront

Appendices Volume 3

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BEHIND THE SEAWALL:

HISTORICAL ARCHAEOLOGY ALONG THE SAN FRANCISCO WATERFRONT

Volume 3

Prepared by Archeo-Tec for the
San Francisco Clean Water Program

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1981

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INTRODUCTION TO VOLUME THREE

This volume contains material which supplements the account of results presented in Volumes 1 and 2. Appendices B, C, and D serve as reference keys to major artifact classes gathered during the course of the Wastewater archaeological program. Appendices A and E provide additional documentation to the main body of the report.

Appendix A contains copies of the nomination forms for the National Register of Historic Place, which have been filed with the State Historic Preservation Office for the **Lydia** (see Chapter 4) and the N-5 dump site (see Chapter 5). These two properties were nominated for National Register status during the course of the archaeological program for the North Shore and Channel Outfalls segments of sewer construction. Also in Appendix A is a letter from Ray Aker describing how he accomplished his ship drawings, which are not only excellent representations of the ship but superb examples of the art of reconstruction drawings.

Appendices B, C, and D contain raw and tabulated data on the artifact collections discussed in Chapters 1 to 12 of this report. They are primarily for the specialist seeking more detailed information on these topics.

Glass and stoneware bottles comprised the largest class of artifacts recovered intact, and data on the complete corpus of bottles recovered at the N-5 alignment are presented in Appendix B. Descriptions are minimal, and they are intended as a classificatory guide to the collection rather than as an exhaustive discussion of individual items. A fuller treatment of wine, drug, and soda bottles appears in Chapters 6, 7, and 8 in the preceding volume.

Appendix C contains data not appearing in Chapter 9 in the analysis of artifacts of Chinese manufacture. These data include additional artifact counts and descriptions by type: presentation of certain specialized technical features and measurements; and tables comparing the N-5 Chinese materials to those from other archaeological collections.

Appendix D supplements Chapter 10, and it contains summary treatments of ceramic artifact types and classes not discussed in the chapter. These include the common white ceramic tableware (known as White Granite or Ironstone), ceramic crucibles, and transfer-printed pot lids.

Appendix E contains a report on seismic testing carried out as a feasibility study on the use of remote sensing techniques along the San Francisco waterfront. Before this study it appeared that these techniques might aid in locating the remaining portions of the **Lydia.** The test, which produced negative results, was conducted by Stephen Palmer, Robert Hall and Cary Hillebrand, then graduate students in the University of California's Department of Engineering Geoscience. They are the authors of this report.

APPENDIX A

NATIONAL REGISTER NOMINATIONS FOR WHALER LYDIA AND CHINESE DUMP AT NORTH POINT STREET, PLUS STORY OF SHIP RECONSTRUCTION DRAWINGS

The letter below from Maritime Consultant Raymond Aker to State Archaeologist Chris L. Chaloupka, dated July 12, 1980, explains the process of creating the ship reconstruction drawings.

Roger Olmsted asked me to send you a description of the process by which the reconstruction drawing was made for the whale ship **Lydia**, the remains of which were found in the trench for the C-2 Channel Outfalls Consolidation on the San Francisco waterfront. As you will see from the below, it was a rather involved process, and in the event it proved to be far more time consuming than I had anticipated. It combined the purpose of integrating the information gathered in 1978 and 1980 into a common structure and to put that information into the context of a whole ship.

The drawing was developed by first graphically projecting the ship remains found in 1978 and 1980 into a united structure at the vicinity of the ship's mainmast. This then served to establish the ship's breadth and depth which served to aid in identifying it through dimensions given for ships listed in the U.S. Register of Merchant Shipping or similar lists.

It was difficult to determine the cross section of the ship because the only surviving side in way of the trench was destroyed during the excavation, leaving nothing but the bottom timbers and slight turn of the bilge. The principal part of that was salvaged and stored at Fort Mason. A complete cross section could have been obtained at the south wall of the trench and a partial section at the north wall by removing the lagging and methodically surveying each end of the ship at the lagging face.

However, there was great pressure to remove the ship as quickly as possible, and as a consequence the idea was possibly not even entertained or thought of. We were extremely fortunate to be given permission to remove some of the lagging at the south wall so as to have a look at the inside of the hull at the lower deck level and almost to the underside of the upper deck. Photographs were made and measurements taken of structural detail in that area which proved extremely useful later for integrating the covering board details excavated this last March.

To develop the ship's cross sections I had to first determine the inclination of the hull. The problem was compounded by the fact that the keel was inclined toward the stern by $11\frac{1}{2}^{\circ}$. The Photogrametric Survey made in 1978 was extremely useful here because it showed how the floor timbers lay in the site. To bring the floor timbers together with the port side of the ship as seen behind the lagging and the covering board found in March, I constructed an elevation drawing of the south wall of the trench to make a grid with the pilings as vertical coordinates and the lagging, 4" x 12" timber, as horizontal coordinates. The port side of the hull and turn of the bilge were then plotted at the lagging face from photographs and combined with projections of the keelson and floor timbers from the Photogrametric Survey.

Because the transverse inclination of the hull had not been measured in 1978, that also had to be graphically determined because there was only one side of the ship to work with. This was needed for the purpose of ascertaining the ship's breadth. Fortunately, I had asked that the angle of deadrise be measured at several places alongside the keel and bottom before the timbers were removed. These must be regarded as approximate because the measurements are taken from the outside of the sheathing on the keel to the sheathing on the hull. If the keel is off vertical, or the sheathing also, the angles will not be true. In March I made some additional measurements of the salvaged section using the floor timbers. Therefore, knowing the approximate deadrise at various stations I was able to apply that to the flat of the floors as they are shown in the Photogrametric Survey in order to establish the vertical centerline of the ship and its inclination from the true vertical. The inclination is about 26°. I was able to verify this by some measurements I had made on the bulwark stanchions and covering board with a carpenter's level in 1980.

Vertical heights relative to the City Base horizontal plane had been taken on the covering board at the excavation made in March 1980 which enabled that to be located in correct relation to the keelson and floor timber heights as established by the Photogrametric Survey.

With the foregoing steps, I was able to project a reasonably true cross section of the ship which I established at the center of the trench. From this I projected the maximum breadth of 26.5' with permissible variation of a foot or so either way depending on how much curvature is allowed for the side. The **Lydia**'s maximum breadth (Registered breadth) turned out to be 27.4'. No change was necessary for the breadth of the section established in the trench.

It was fortunate that I had gone to Fort Mason this March to measure the salvaged section because in doing so I found wells cut into a frame on each side of the keelson to receive the lower ends of the pumps. The pumps were normally located close abaft the mainmast, so in effect I had also found where it had been stepped. Tragically, the lower end of the mast and its step were thoughtlessly ripped out during excavation and lost. Unfortunately, most of the top of the keelson was sheared away with them. A few sheared bolts that survive may pertain to the step.

Because the salvaged section can be located accurately in the trench by the Photogrametric Survey, I was able to establish the location of the mainmast as a reference point from which to reconstruct the ship as a whole. That is, the location of the stem and sternpost can be approximately located by ratio from other ships. By knowing that, I was able to determine that there were two more chainplates forward of the group uncovered last March. Lack of time prevented us from looking for one of these, but the forwardmost one was probably lost in the trench excavation.

You may recall that in March we found the seats for two beams cut into the upper deck shelf piece. By projection, I found that the forward one aligned with a mortise cut into the top of the keelson on the salvaged section. These mortises received a stanchion for centerline support of the lower deck beams. Normally, the upper deck beams are located over the lower ones so that their stanchions will transmit load to the lower one. This mortise is the only one to survive. Had we been on our toes in 1978 we could have uncovered another one near the south wall of the trench, but all of the others in the trench had been sheared off. Surviving ends of the stanchion were probably lost during excavation.

The next beam forward of the above two is located by the remains of a standing knee found in place just inside the lagging at the south wall in 1978. A lower deck beam also in place was seen beyond this knee when we tunneled back inside the lagging. Its horizontal position was not measured, but that can be ascertained by reference to the frame which it abuts against. Surprisingly, there was no hanging knee below this beam, nor was there any evidence that there had been a hanging knee for the beam forward of it where the standing knee was found.

I conclude that standing knees in this ship substituted for the usual hanging knees placed under the beams, thereby leaving more clear space in the hold. There is some precedence for this, and it seems advantageous to the whaler because the between deck was used mainly as a living and working space.

By very good fortune we found fragments of a T & G planked bulkhead on the after side of the standing knee inside the lagging. On a whaler this would be the forward bulkhead of the steerage compartment where the harpooners, coopers, carpenter, cook and other non-watchstanders were berthed.

The foregoing completed a midship structure that included the mainmast and pumps with several feet aft of them comprising part of the upper and lower deck framing, bulwark, and chainplates.

Prior to developing the preliminary reconstruction drawing I had reached the conclusion that the ship was a whaler. Your finding of the heel of a boat support stanchion or davit outside the covering board clinched that conclusion. The ship's relatively high deadrise, the finding of the between deck bulkhead, the absence of copper sheathing over the wood sheathing as might be expected for an Arctic whaler, and finally the heel of the timber at the covering board all added up to a whaler. Considering that the ship appeared to be very old, a design was patterned on ships built for whaling in the 1850's, using the known midship section as a starting point.

The drawing was revised when the Olmsteds turned up an identification for the ship as the **Lydia**, bark, 329.77 gross tons, 104' length, 27.4 breadth, and 18' depth, built in 1840 at Mattapoisett, Massachusetts. Reconstruction of the midship section apparently went together correctly because it did not need to be revised to accommodate the dimensions of the **Lydia**. My assumed length had to be reduced a few feet, however, the stern clipped for a more upright transom, and the clipper bow popular in the 1850's shortened for the more full-bodied bow typical for 1840. The **Charles W. Morgan** built at New Bedford, Massachusetts, in 1841 became the perfect model for the **Lydia**. As you may know, that vessel is still in existence at Mystic, Connecticut.

The process of producing the preliminary reconstruction drawing seems simple and straightforward in retrospect, but it was in fact a very long and at times difficult process. It is the end product of a site drawing yet to be completed, drawings of structural details that were seen and recorded in 1978 and 1980 which should be incorporated on a third drawing, numerous hours in study of the remains of the ship, and research into ship construction and whalers of the **Lydia**'s era.

The purpose of the reconstruction, as stated on the drawing, is to interpret the remains of the ship that were seen and recovered and to put them into the context of a ship as a whole. As photographs of the **Lydia** and other information pertaining to her comes in, as also possible further archaeological investigation, it will be necessary to refine this drawing. In the meantime it enables people to visualize the extent of the ship's parts that may yet survive at the site and to anticipate the possible problems that may be involved in further excavation or recovery of the parts.

The drawing serves an additional important purpose. A section of the ship has been salvaged, and no doubt it will eventually be placed on public display in San Francisco. That may be especially true now that the National Maritime Museum of San Francisco has acquired an important whaling collection. The reconstruction will enable the section to be exhibited in true relation to that part of the ship from which it came.

I am pleased that the ship has turned out to be one with meaningful significance to San Francisco, inasmuch as the city had once been one of the most important whaling centers in the world. The first picture that I have seen of the **Lydia** shows a very handsome ship.

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NATIONAL PARK SERVICE

NATIONAL REGISTER OF HISTORIC PLACES INVENTORY -- NOMINATION FORM

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SEE INSTRUCTIONS IN *HOW TO COMPLETE NATIONAL REGISTER FORMS*
TYPE ALL ENTRIES -- COMPLETE APPLICABLE SECTIONS

1 NAME

HISTORIC The LYDIA - Register Number 14856 - International Signal Code H. M. G. D. Archaeological Site # 4 - SFR - 94 H

AND/OR COMMON The "Old Whaling Bark Lydia "

2 LOCATION

STREET & NUMBER On Seawall Lot # 3801 - between the line of King Street and The Embarcadero. The hull of the Lydia lies on an East-West line—see record map, 1919 Sanborn Map & topo-map.

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CONGRESSIONAL DISTRICT

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3 CLASSIFICATION

In transition as part of the Northeast Waterfront Plan, Rincon Point Portion

CATEGORY	OWNERSHIP	STATUS	PRESENT USE	
__DISTRICT	X PUBLIC	__OCCUPIED	__AGRICULTURE	__MUSEUM
__BUILDING(S)	__PRIVATE	X UNOCCUPIED	__COMMERCIAL	__PARK
__STRUCTURE	__BOTH	__WORK IN PROGRESS	__EDUCATIONAL	__PRIVATE RESIDENCE
X SITE	**PUBLIC ACQUISITION**	**ACCESSIBLE**	__ENTERTAINMENT	__RELIGIOUS
X OBJECT	__IN PROCESS	__YES: RESTRICTED	__GOVERNMENT	__SCIENTIFIC
	__BEING CONSIDERED	X YES: UNRESTRICTED	__INDUSTRIAL	__TRANSPORTATION
		__NO	__MILITARY	X OTHER

4 OWNER OF PROPERTY

NAME Title is held by the State of California, but as a result of the Burton Act of of Jan. 1970, the land was given in trust to the City of San Francisco acting by & through the San Francisco Port Authority.

STREET & NUMBER Ferry Building

CITY, TOWN San Francisco __ VICINITY OF STATE California

5 LOCATION OF LEGAL DESCRIPTION

COURTHOUSE, REGISTRY OF DEEDS, ETC. Recorder's Office

STREET & NUMBER San Francisco City Hall

CITY, TOWN San Francisco STATE California

6 REPRESENTATION IN EXISTING SURVEYS

TITLE Record Map of the Site as Surveyed for the Wastewater Management

DATE June 1978 __FEDERAL __STATE __COUNTY X LOCAL

DEPOSITORY FOR SURVEY RECORDS San Francisco Wastewater Program

CITY, TOWN 150 Hayes Street (6th Floor) San Francisco, STATE California

APPENDIX B

CATALOG OF BOTTLE TYPES COLLECTED AT N-5

Contents:

Beer Bottles (Stoneware), page 596
Beverage Bottles (Glass), page 611
Bitters Bottles, page 619
Blacking Bottles, page 623
Cologne, Cosmetic, and Perfume Bottles, page 627
Food and Condiment Bottles, page 634
Ink Bottles (Glass), page 641
Ink Bottles (Stoneware), page 644
Mucilage and Glue Bottles, page 648
Snuff Bottles, page 651
Figures, page 652

This appendix presents narrative and tabular summaries of the quantities and types of bottles found in the N-5 collection. It provides a concise descriptive orientation to the classes of bottles not treated in Chapters 6 (wine bottles), 7 (drug bottles), and 8 (soda bottles) of **Behind the Seawall.** Only included are specimens that are complete or large enough to be identified by size and class.

An attempt has been made to incorporate the nomenclature utilized in the contemporary nineteenth-century glass manufacturing and wholesaling trades. Definitions for such morphological, functional, and volumetric terminology, if not stated in this introduction, appear below in the discussion of each particular class. This specialized nomenclature has been gained from analysis of catalogs published by late-nineteenth century glassworks and glassware dealers. In using these terms, we replace loosely employed descriptive terminology and common names, borrowed primarily from the bottle-collecting fraternity, with a nomenclature more accurate in terms of manufacturing process and more consistent temporally with the dates of the N-5 artifacts.

CONVENTIONS AND ABBREVIATIONS

This appendix describes the bottles only briefly, relying instead on standardized conventions and abbreviations. In some classes of bottles, especially those constructed of stoneware rather than glass, a departure from standard terms has been made, and the alternate systems are individually treated within the class discussion. For the remaining bottle classifications, the following apply:

(1) Terms and abbreviations used for basic morphological descriptions are illustrated in Figures B.01a and B.01b.

(2) Morphological terms and illustrations of lip finishes appear in Figure B.02.

(3) Geometric shape of a bottle (e.g., circular, square, rectangular) is defined as the shape of a horizontal cross-section taken at the point of greatest width, with the bottle resting on its base. All dimensions were taken with the bottle in this position. Width and breadth were measured at the point of maximum horizontal extent in the case of sloping sides.

(4) All linear measurements are expressed as a number (whole and/or fraction) with inches as the unit of measure.

(5) In describing the linear measurements of a complete or fragmentary specimen, the sequence of numerical expressions will represent: (maximum height) x (maximum diameter (if cylindrical) or maximum width (if equilateral in section) x (maximum widths of adjacent, dissimilar sides).

(6) All volumetrics are expressed in fluid ounces and abbreviated "oz."

(7) Color refers to that observed reflected (stoneware) or transmitted (glass) in daylight.

(8) Wording or symbols present on the bottles in the form of embossing, debossing (impressed stamps), or printing on paper labels are enclosed in quotation marks, using capital or lower case letters as in the original text. Multiple lines on a single

side or face are separated by a diagonal slash (/), while lines of wording or symbols on different sides or faces of the container are separated by double diagonal lines (//).

ARRANGEMENT OF THE APPENDIX

Bottles are divided into ten general classes, based on their intended use or function, with some variation related to construction material (stoneware or glass). The major classifications are further divided into sub-classes according to more specific function, morphological differences, or proprietary markings.

The ten major classes and their subdivisions are outlined below: **Beer Bottles (Stoneware),** Manufacturer's Marks (Table B.01); **Beverage Bottles (Glass),** Black Glass (Table B.02), Ale (Embossed), Whiskey (Embossed), Oval Flasks, Wines or Brandies, Export Lagers (Table B.03), London Gin; **Bitters Bottles; Blacking Bottles,** Salt Glazed Stoneware (Table B.04), Glass; **Cologne, Cosmetic, and Perfume Bottles,** Embossed Bottles, Bottles with no Proprietary Embossing (High Oval Cologne; Fluted; Acorn Top Toothpowder; Conical Colognes); **Food and Condiment Bottles,** Club Sauce, Capers, Flavoring Extract, Horseradish, Mustard Bottles, Square Pickle Jar, Pepper Sauces, Tabasco Sauce, Olive Oils, Essence of Jamaica Ginger, Trommer Extract of Malt, Valentine's Meat Juice; **Ink Bottles (Glass),** Pyramid Ink Stands, Conical Ink Stands, (Plain Cone, Ring Cone), Dome-Shaped Ink Stands, Cylindrical Ink Bottles, Square Ink Bottles (Square Carmine, Square Ink Stand), Morgans Patent; **Ink Bottles (Stoneware),** Cylindrical, Conical; **Mucilage and Glue Bottles,** Bell Style, Pyramidal Mucilage Bottles, (Octagonal, 10-sided, 16-sided, Egyptian Tenexine), Cook's Leather Cement; **Snuff Bottles.** Following these listings are all the figures for Appendix B. Photographs are by Ed Torres, unless otherwise credited.

BEER BOTTLES -- STONEWARE

This group of bottles, whose members vary only slightly in material composition and basic morphology, is classed according to primary function, viz., the packaging of imported beers such as British ales, stout, and porter. Although no embossing, debossing, or paper labeling on the bottles in the N-5 collection revealed the nature of their contents, several specimens possessed all or part of the lead foil capsule that sealed the cork, lip, and part of the upper body. The foil capsules were embossed with brand names, patent and trademark information that disclosed the commercial use for these sturdy containers.

Stoneware beer bottles identical to those in N-5 were found in quantity at the Golden Eagle site in Sacramento, California, some of which still retained original paper labels from the London ale firm of Byass. These bottles (at least 70 specimens) were determined to have been discarded under the floor of a saloon during the period 1874-78 (Praetzellis, Praetzellis and Brown 1980: 7-12 and 7-63).

Seventy complete stoneware beer bottles, with many more neck, base, and body fragments, were recovered in the N-5 excavation. Of these intact specimens, 46 were impressed (debossed) with a mark that identified the manufacturer of the bottle. Twenty base fragments also displayed manufacturer's marks. The great majority (80.3 percent) of the marks indicated potteries located in Glasgow, Scotland, with 15.2 percent showing manufacture in Bristol and 4.5 percent in Liverpool, England.

With exception, the complete bottles and larger neck and base fragments demonstrated a remarkably consistant basic form-a tall, cylindrical body that gradually tapers upward to a heavy lip finish. There is no clear transition point where body merges into shoulder or shoulder into neck; instead the form is a cylinder at the base that gently turns into a cone about mid-height. Fractured examples reveal a wall thickness that averages 1/4 inch (see Figure B.03).

Only two distinct sizes of stoneware beer bottles were present at N-5. The smaller size ranges from 8 1/4 to 8 1/2 inches in height, with a base diameter of 2 3/4 to 3 inches, and a capacity of 12 fluid ounces. The larger size ranges 10 to 10 1/2 inches in height, 3 1/2 inches base diameter, and a 24 fluid ounce capacity. Advertising contemporary with the distribution of these beverage bottles conveniently refers to the smaller size as a "pint" and the larger as a "quart".

With the exception of one neck fragment, all lip finishes are essentially of two types--a plain broad sloping collar 1/2 to 7/8 inch in height, with the addition on many specimens of a small ring or bead encircling the bottle immediately below the broad collar. The inside rim diameter (IRD) of the neck at the mouth ranges 5/8 to 3/4 inch. Both lip finishes, with and without the ring, are similar to those applied to glass bottles of the latter nineteenth century. They are known respectively in the glassmaking trade as "brandy" and "oil" finishes.

The remaining major difference within the class is color. All examples are basically monochromatic off-white or cream in color, internally as well as externally, but of the group of complete specimens, 23 out of 70 (33 percent) have added a buff to dark ochre color which entirely covers the upper third of the bottle (see Figure B.03).

In gross morphology, the N-5 stoneware beer bottles do not truly resemble in form any glass bottle made by contemporary European or American manufacturers. Yet, at least one present-day Scottish pottery authority points out that in Scotland they are "...somewhat grandiosely known as the 'champagne shape', while the term 'square shape' is applied to those (stoneware) bottles which have a shoulder or carination, above which the curve is concave" (Cruickshank, personal communication). Both of these basic forms of stoneware beverage bottles, the "champagne" and the "square", were present in the 1865 cargo of the doomed Missouri River steamer **Bertrand**, where their contents were hypothesized to be ale (Switzer 1974:9-14). No "square shape" stoneware beer bottles were excavated in the temporally later contexts of the N-5 dump or the Golden Eagle site, however, suggesting the tentative conclusion that the "champagne shape" was the successor form, at least for western U.S. markets.

FUNCTION

Stoneware beer bottles in the N-5 collection were used primarily to import British malt liquors. Substantial evidence for this conclusion is the presence in situ of lead foil capsules embossed with proprietary information which seal some of the bottles with their original contents of ale, porter, or stout. Most explicit is the capsule embossed, "Tennent's Pale Ale, Bottled by J & R Tennent, Wellpark Brewery," covering the cork-sealed top of a typical small size, monochrome cream-colored bottle with a collar and ring lip finish. Another specimen with original contents is sealed with a lead foil capsule marked, "E. Johnson & Co., Liverpool (mariner's compass) Trade Mark." This capsule covers the top of a large, monochrome cream-colored bottle down to a point just below the collar and ring finish. The bottle has a "price Bristol" manufacturer's mark impressed near the base. A third bottle retains the intact lead foil capsule embossed, "T.B. Hall & Co., Export Bottlers, Liverpool (boar's head) Trade Mark." This small, monochrome cream-colored bottle with collar and ring finish was made by H. Kennedy's Barrowfield Pottery in Glasgow, as evidenced by his mark. This particular bottle is additionally informative in that it has been fractured vertically into approximately equal halves. Careful separation allowed observation in vertical section of a cork presently 1 1/2 inches in length, constricted its middle in conformance with the internal nature of the neck, but which was apparently straight-sided or cylindrical when first inserted to stopper the bottle. Two rust tracks on the dorsal surface of the cork, as well as generally diffuse rust deposits about the mouth, collar, and ring of the bottle suggest that an iron wire ligature originally secured the cork to prevent escape of the bottle's effervescent contents. The inverted cup-shaped lead foil capsules are tightly crimped about the wired cork assembly, especially in the groove between the collar and ring, as well as just below the ring.

Further evidence of the use of stoneware beer bottles for imported British beers is suggested. (1) the several examples found under the floor of a Sacramento, California, saloon retaining their original "Byass" London ale labels and dated to the late 1870s (Praetzellis, Praetzellis and Brown 1980:7-12, 7-63); (2) a small size, two-tone stoneware bottle with plain broad collar lip (examined in a private collection) that possesses an oval side label reading, "E. & J. Burke Extra Foreign Stout, Caution--none genuine without our patent capsule bearing our trade mark, Dublin." A separate diamond-shaped shoulder label on this bottle reads "Pacific Coast

Agents, Sherwood & Sherwood, San Francisco." The firm of Sherwood & Sherwood, importers and commission merchants specializing in English groceries and liquors, was first listed in the San Francisco business directory of 1888 (Langley). (3) in another collection, the trademarked facsimile signature, "Edward & John Burke", was found embossed on the remnants of a lead foil capsule attached to a two-tone, small size stoneware beer bottle impressed with the "Port Dundas Pottery Co., Glasgow" mark.

Confirmation that Burke, Tennent and the others were manufacturing malt liquors during the 1870s is found in a report of San Francisco importations for the year 1878. Under "Foregin Ales and Stout in Bottles" and "English Bottled Beer" are listed Tennent's, Johnson's, Hall's, Burke's, and Byass's brands, among others, with Tennent's porter, Tennent's stout, Tennent's ale, Johnson's Guinness stout, and Burke's Guinness stout all selling at wholesale between $3 and $4 per dozen bottles. The bottle capacity seems to have been of minor monetary significance since both pints and quarts of several brands were listed at the same quotations (Steele 1879:575-76).

A San Francisco newspaper advertisement of the period announced "English Ales and Porters, now landing in excellent condition, Tennent's Pale Ale, Byass Champagne Ale, Burke's Guinness' Dublin Porter, Burke's Bass Pale Ale, in quarts and pints...for sale by Richards & Harrison, corner Battery and Commercial Streets" (Daily **Alta California** 1880). "Tennets (sic) Scotch Ale" was offered for sale by a San Francisco merchant even prior to the discovery of gold in California (California **Star** 1847).

The importation data and the advertisements cited do not tell us if the beer bottles were of stoneware or glass, but the names embossed on the N-5 lead foil capsules are clearly identified as British brewers and bottlers of malt liquors, and little question remains regarding the N-5 containers' precise function in commerce.

Brewing

In essentials, the brewing of malt liquors in Britain is a simple sequence of steps that has remained unchanged from the eighteenth century to the present day. An eighteenth-century brewer would be quite at home in a present-day brewery provided he did not visit the sections of the plant devoted to processing after fermentation. Malt (germinated grain, usually in situ of lead foil capsules embossed with proprietary information which seal some of the bottles with their original contents of ale, porter, or stout. Most explicit is the capsule embossed, "Tennent's Pale Ale, Bottled by J & R Tennent, Wellpark Brewery," covering the cork-sealed top of a typical small size, monochrome cream-colored bottle with a collar and ring lip finish. Another specimen with original contents is sealed with a lead foil capsule marked, "E. Johnson & Co., Liverpool (mariner's compass) Trade Mark." This capsule covers the top of a large, monochrome cream-colored bottle down to a point just below the collar and ring finish. The bottle has a "price Bristol" manufacturer's mark impressed near the base. A third bottle retains the intact lead foil capsule embossed, "T.B. Hall & Co., Export Bottlers, Liverpool (boar's head) Trade Mark." This small, monochrome cream-colored bottle with collar and ring finish was made by H. Kennedy's Barrowfield Pottery in Glasgow, as evidenced by his mark. This particular bottle is additionally informative in that it has been fractured vertically into approximately equal halves. Careful separation allowed observation in vertical section of a cork presently 1 1/2 inches in length, constricted its middle in conformance with the internal nature of the neck, but which was apparently straight-sided or cylindrical when first inserted to stopper the bottle. Two rust tracks on the dorsal surface of the cork, as well as generally diffuse rust deposits about the mouth, collar, and ring of the bottle suggest that an iron wire ligature originally secured the cork to prevent escape of the bottle's effervescent contents. The inverted cup-shaped lead foil capsules are tightly crimped about the wired cork assembly, especially in the groove between the collar and ring, as well as just below the ring.

Further evidence of the use of stoneware beer bottles for imported British beers is suggested. (1) the several examples found under the floor of a Sacramento, California, saloon retaining their original "Byass" London ale labels and dated to the late 1870s (Praetzellis, Praetzellis and Brown 1980:7-12, 7-63); (2) a small size, two-tone stoneware bottle with plain broad collar lip (examined in a private collection) that possesses an oval side label reading, "E. & J. Burke Extra Foreign Stout, Caution--none genuine without our patent capsule bearing our trade mark, Dublin." A separate diamond-shaped shoulder label on this bottle reads "Pacific Coast

Agents, Sherwood & Sherwood, San Francisco." The firm of Sherwood & Sherwood, importers and commission merchants specializing in English groceries and liquors, was first listed in the San Francisco business directory of 1888 (Langley). (3) in another collection, the trademarked facsimile signature, "Edward & John Burke", was found embossed on the remnants of a lead foil capsule attached to a two-tone, small size stoneware beer bottle impressed with the "Port Dundas Pottery Co., Glasgow" mark.

Confirmation that Burke, Tennent and the others were manufacturing malt liquors during the 1870s is found in a report of San Francisco importations for the year 1878. Under "Foregin Ales and Stout in Bottles" and "English Bottled Beer" are listed Tennent's, Johnson's, Hall's, Burke's, and Byass's brands, among others, with Tennent's porter, Tennent's stout, Tennent's ale, Johnson's Guinness stout, and Burke's Guinness stout all selling at wholesale between $3 and $4 per dozen bottles. The bottle capacity seems to have been of minor monetary significance since both pints and quarts of several brands were listed at the same quotations (Steele 1879:575-76).

A San Francisco newspaper advertisement of the period announced "English Ales and Porters, now landing in excellent condition, Tennent's Pale Ale, Byass Champagne Ale, Burke's Guinness' Dublin Porter, Burke's Bass Pale Ale, in quarts and pints...for sale by Richards & Harrison, corner Battery and Commercial Streets" (Daily **Alta California** 1880). "Tennets (sic) Scotch Ale" was offered for sale by a San Francisco merchant even prior to the discovery of gold in California (California **Star** 1847).

The importation data and the advertisements cited do not tell us if the beer bottles were of stoneware or glass, but the names embossed on the N-5 lead foil capsules are clearly identified as British brewers and bottlers of malt liquors, and little question remains regarding the N-5 containers' precise function in commerce.

Brewing

In essentials, the brewing of malt liquors in Britain is a simple sequence of steps that has remained unchanged from the eighteenth century to the present day. An eighteenth-century brewer would be quite at home in a present-day brewery provided he did not visit the sections of the plant devoted to processing after fermentation. Malt (germinated grain, usually barley) is mixed with hot water in order to convert the starch in the grain into sugar. This sweet extract called "wort" is drawn off and boiled with hops to give flavor and preserving qualities. Yeast is added after the hopped wort has been separated from the spent hops and cooled. In fermentation, the yeast converts the maltose sugar in the wort to alcohol and gaseous carbon dioxide, and after the yeast has been removed, the resultant liquor is beer (Mathias 1959:xviii). The brewing of British beers (ales, stout, porter) uses "top fermentation" yeasts, i.e., varieties that rise to the top of the fermenting beer forming a relatively thick foam. "Bottom fermentation" yeasts, on the other hand, are those found in brewing **lager** beers, introduced by the Germans and the type most popular with the United States consumer. The general term "malt liquor" thus refers to all beverages produced by the alcoholic fermentation of a malted cereal grain.

Prior to the nineteenth century, there was a material as well as a semantic difference between the words "beer" and "ale", but by the mid-nineteenth century, "beer" had become a generic term that included all malt liquors. Among the British beers, the real contrast is between the **ales**, which are usually light-colored (pale) or nutbrown in color, and range in alcoholic content from 3 to 6.5 percent by weight; **stout**, a dark, often black beer with a rich malty taste and an alcoholic content that can exceed 5 percent; and porter, another dark, full-bodied beer resembling weak stout (**Encyclopedia Britannica** 1971:v3:379).

Brewing as a California industry had progressed by 1874 to the extent that there were 43 firms in San Francisco engaged in the production of one kind of beer or another (Langley 1874). Edwin Merrifield and Levi Rosener, proprietors of the Star Brewery at the southeast corner of Eleventh and Folsom streets, indicated in their advertising that they manufactured "Star" Ale and Porter, available in a variety of containers including "Stone and Glass Qts. and Pts." (**Commercial Herald & Market Review** 1875). This advertisement only suggests re-use of the imported stoneware beverage bottles, but direct evidence of the practice exists in a surviving (private collection) bottle bearing the "Grosvenor Glasgow" manufacturer's mark and the paper label of a San Francisco ale brewer, John Hamlyn Burnell. The stoneware beer bottle is two-tone, small size, with plain broad collar finish. The label reads, "Albion Ale, Estab d 1875, J. H. Burnell". According to Rich, John H. Burnell of the Albion Brewery in San Francisco first received his training under William Garton, the well-known London brewer, and subsequently was brewer at the Shepton Mallett plant, owned by the Anglo-Bavarian Brewing Company of England. In 1875 Burnell shipped machinery for an ale and porter plant direct from England, establishing the Albion Brewery in that year. He tunneled his cellars out of solid rock, and his bottling vaults were also underground (Rich 1903:447). John Burnell first appears in the San Francisco City Directory for 1877 in the partnership, "Burnell & Simpkins (Albion) SW cor G and 9th Ave, South SF." (Langley 1877). The style of the firm's name changed over the years, with J.H. Burnell listed as sole proprietor during 1886-90, dating the labeled bottle to that period.

MANUFACTURE OF STONEWARE BEER BOTTLES

Close examination of the bottles and fragments in this class reveals that they are all stoneware, hand-thrown on the potter's wheel. (Stoneware is by definition pottery that has been fired to the point where vitrification or fusion of the materials begins to take place, thus making the structure of the clay dense and non-permeable.) The ideal density for stoneware varies with the intended use. For most wares intended to contain food or beverages, an absorbency of 2 to 3 percent is not objectionable. A low absorbency is always a practical advantage because it insures that even though the glaze of a piece may be faulty, liquids will not seep through the body. Vitrification may be reached at a higher or lower temperature depending on materials in the clay body, but true stoneware is usually fired to at least 2200^{0}F (1200^{0}C) to achieve the desired low absorbency as well as durability. This latter quality is not acquired to a suitable degree in pottery fired at lower temperatures even though vitrification or "maturity" may have been reached (Rhodes 1959:58-59). Although stoneware is impermeable to foodstuffs, a smooth, glazed surface is nevertheless desirable. In the case of bottles, glazing (covering with glass) allows the pottery to be cleaned more easily for reuse, provides a more comfortable "feel" to hand and mouth, and yields a more aesthetic, shiny surface than would be offered if the vessel were left unglazed.

The clay used in manufacturing British stoneware bottles such as those found in N-5 was the fine white clay mined in Devonshire in southwest England and brought by sea to the potteries in northern England. As early as 1720 the light, cream-colored pottery made from this clay soon began to displace the earlier gray or brown wares, and by the mid-nineteenth century, common stoneware bottles, coated inside and out with a transparent glaze, were being made at Bristol and Chesterfield from the Devonshire import (Rhodes 1959:28; Knapp 1849:268).

The stoneware beer bottles in N-5 are constructed of a very pale gray to almost white clay body, and there is little or no color tone difference between the unglazed basal portions of the bottles and their white or cream-colored glazed external and internal surfaces. There is also no substantial color difference between the internal clay body (as exposed in the margins of fragments) and the white glazed surface. This suggests that the transparent glazes reported by Knapp in 1849 (Ibid.) are the same utilized on the examples in N-5.

Application of the liquid glaze (a suspension of certain glass-forming minerals in water) would most effectively be achieved by filling and dipping the bottles, thus coating the inner and outer surfaces. In modern practice, the pottery is first fired to a "bisque" state at about 1950^{0}F to prevent its dissolving and collapsing in the watery glaze liquid. The base of the bottle is then cleaned of any glaze material with a wet sponge so that the vessel will not fuse to the shelf during the glaze firing in the kiln. Jewitt, however, reports that in the early 1830s a Mr. Powell of the Temple Gate Pottery in Bristol invented an improved stoneware that was "...coated with a glaze which is produced simultaneously with the ware itself, so the one firing only is needed" (Jewitt 1883:233). This technique may be identical to the one the same author describes as being used by the Price pottery in the same city in 1842 when "through the experiments of Mr. Powell it was found practicable to dip the stoneware into liquid glaze in its green (thoroughly dry but unfired) state, instead of first burning and then 'smearing' as formerly practised" (Ibid.,:232). The ochre-colored upper portions of many of the stoneware beer bottles found in N-5 were undoubtedly created by a second dipping of the inverted bottle into a thin glaze liquid containing a low percentage of iron oxide. Probably decorative in nature, this two-tone appearance may be a reminiscence of eighteenth century English stoneware bottles in which "the body was gray and covered to a point below the midsection with a iron-oxide slip that turned to either purple or a rich, brown stipple in the firing (Noël Hume 1976:78).

Although transparent glazes applied by dipping are discussed here because of their relevance to the N-5 stoneware beer bottles, it should be made clear that the glazing technique most popular with British potters at mid-nineteenth century for common stoneware was the salt-glaze (Knapp 1849:268; see also discussion of stoneware mineral water bottles in Chapter 8, above). In salt glazing, common salt is thrown into the fire-boxes of the kiln when the highest tempeature is reached. The salt volatilizes, and the sodium from the salt combines with the activated silica in the ware to form a thin glaze. The salt vapor, being subject to the kiln's draft patterns, fills the entire ware chamber and reacts with any exposed surface, including the walls of the chamber. Since interiors and resting bases of bottles are not exposed to the drafts of the kiln, those particular surfaces do not receive the soda-glass coating. The earliest type of vitrified ware made in Europe was probably salt-glazed pottery, which originated in Germany and was a highly developed manufacture by the fifteenth century. The first stoneware in England was made by John Dwight about 1680 at his pottery at Fulham and in 1684 a royal patent was granted Dwight for the exclusive right to manufacture salt-glazed stoneware. His patent, however, expired in 1699, and soon numerous potteries were producing stoneware in England (Rhodes 1959:27-28).

Industrialization

The mass production of common, utilitarian bottles in England can be traced at least to the second decade of the nineteenth century. Jewitt quotes the description of Codnor Park pottery, written by Sir Richard Phillips in 1828:

> Over near Codnor Castle I viewed a rough and ill-built manufactory, where they turn and bake those opaque bottles used for ginger-beer, soda-water, liquid blacking, &c. About 50 women and children finish 100 gross per day, and they sell the half-pints at 15d and 16d per doz., and all pints at 2s., and quarts at 3s. 6d. They are made of the clay of the

> vicinity, and the agent for selling them is Kemp, in Milk Street, London. They are harder and less liable to burst than glass bottles (Jewitt 1883:356).

In discussing the several potteries active in Scotland, Jewitt mentions the stimulus given to the industry at mid-nineteenth century by the sudden need for stoneware beer bottles. At the Caledonian Pottery, for example, "in 1851, the demand sprang up for stoneware ale and other bottles, and this has become one of the staple trades of Glasgow and the surrounding district" (1883:623), and in 1856 at another Glasgow works, the Port Dundas Pottery Company, "...a great demand having thus sprung up for stoneware beer-bottles, the works were greatly enlarged" (1883:620). The sudden demand in the early 1850s for stoneware beer bottles may very likely reflect the swelling population of California during the Gold Rush and its increased thirst for British malt liquors.

Production of stoneware beverage containers had not subsided by the early 1880s. Again according to Jewitt, in his 1883 commentary on the Denby Pottery of Joseph Bourne & Son, "bottles are the staple production, and almost every variety both in the patented vitreous stone and white glazed, are made...thousands weekly...ale, porter, ginger-beer..." (1883:358). Another English pottery, Langley Mill Pottery, established in 1865, produced at the time of Jewitt's writing, "vitrified stoneware of similar character and quality of that of Messrs. Bourne at Denby. In this ware a large trade is done in ginger-beer, ink, beer, and other bottles (1883:360-61).

By the 1860s mechanization had proceeded to the stage where steamdriven potter's wheels were feasible. At Port Dundas, where by far the greatest portion of ware was thrown on the wheel by hand as opposed to molding, motive power was provided by girls turning a large driving wheel connected to several wheelheads by a rope. In 1866 the proprietor endeavored to introduce steam power, but this modernization was resisted by the workers for some three years before its advantages were appreciated and steam machinery was substituted for handpower throughout the whole factory (Jewitt 1883:620).

The careful precision of form, size, and finish in hand-thrown pottery such as stoneware bottles was achieved through the use of templates or "jiggers" that were held against the vertical aspect of the freshly thrown bottle while still turning on the wheel, and thereby determined its final shape. Rhodes feels that the use of these templates gives the throwing a precise yet almost metallic quality, very different from the more fluid and sensitive shapes of Chinese pottey (1959:27). Templates, either as a single unit creating at once a bottle's entire silhouette, or as smaller units combining to form individual components of a bottle's total profile, were most probably fashioned by the various potteries for their own use and thus acquired individualized characteristics. At the same time, it is reasonable to assume that the potteries were under some restraints to produce bottles that were acceptable to the beer bottling industry, i.e., the approximate net capacity and the inside rim (mouth) diameter (to accommodate common corks) would be features requiring some limits on variance.

An outstanding characteristic distinguishing the N-5 bottles from the collection of stoneware bottles found in the steamer **Bertrand** is the difference in lip-finish types. This characteristic is of course a good example of the morphological variance created by the use of templates. For the most part, the N-5 bottles terminate in a broad collar, slightly tapering toward the mouth, and generally ranging from 1/2 to 7/8 inch in height. Directly below the collar, in the majority of examples, appears a single ring--semi-circular in vertical section. The simple collar, without ring, is found on about 25 percent of the neck finishes in N-5, but is altogether absent in the **Bertrand** bottles. On the other hand, the flaring collar and ring combinations with more acutely angular basal edges, as found on the **Bertrand** (Switzer's subtypes 1c and 1d), are represented in N-5 by only one neck fragment. These angular neck finishes reflect and seem to be companion to the "square" or angular shouldered bottles identified by Switzer's subtypes 1c and 1d (1974:11-12).

Some 66 complete and partial stoneware beer bottles were legibly marked by their respective manufacturers in the N-5 collection. These marks, effected by pressing a stamp into the soft clay bottle immediately after being thrown and trimmed with a template, invariably appear adjacent to the basal margin. All marks are circular or oval in basic configuration with diameters ranging from 5/8 to 1 inch; they give the proprietor's and/or pottery's commercial name, and location by town. So conspicuous on the

N-5 bottles, manufacturer's marks, with one exception, are completely lacking on the examples of stoneware bottles rescued from the **Bertrand.** Many of the **Bertrand** bottles were stamped with a single letter near the base, e.g., "J", "O", "W", and the like, but nothing else in combination. Letters as well as numerals are incorporated into the circular marks on N-5 examples. Although unverified, one opinion is that the letters and numerals are a form of worker indentification, each potter having his own code. Presumably the potters, worked on piece work rates, and therefore they needed to have some means of identifying the pieces they had produced (Cruickshank, personal communication).

The difference in morphological types between the **Bertrand** and N-5 collection remains problematical at this stage of our historical knowledge. In general, the neck finishes of the N-5 bottles are simpler in form than those of the 1865 collection recoverd from the **Bertrand.** If it is assumed that they were produced later (since the date of the deposition of N-5 is estimated to follow the sinking of the **Bertrand** by about 20 years), it may be that simplification of the neck finish represents a more efficient form related to a technical advance in closure procedure. However, it is also possible that the bottles were merely produced by different manufactories, since only one type of the **Bertrand** bottles is identified by maker. Whatever the reason, the differences between the two collections are distinctive enough to warrant further investigation.

DESCRIPTIVE DETAILS

The most significant characteristic variation within the class of N-5 stoneware beer bottles occurs in the impressed manufacturer's marks. Identifiable bottles and fragments are therefore sub-classified in Table B.01 below according to proprietor's or pottery's commercial name, in alphabetical order, as they appear in the several marks. Bottles and fragments on which the mark is illegible or absent are grouped together as a final sub-class. The following abbreviations are used:

pt= pint (small size); qt= quart (large size); mono = monochrome cream or white; duo= duotone (ochre top with cream base); C= plain broad collar; C/R= collar with ring.

TABLE B.01

STONEWARE BEER BOTTLES

Mark	Number of Examples	Condition	Size	Color	Lip Finish	Code Numbers or letters
Campbellfield Glasgow Pottery	2	complete	pt	mono	C/R	18,2
	3	base frag	pt	mono		2,3
Davidson Glasgow	1	complete	pt	duo	C/R	8
	1	lip missing	pt	duo		8
	1*	complete	pt	duo	C/R	18
Grosvenor Glasgow	2	complete	pt	duo	C	2,4
	1	base frag	pt			2
	5	complete	qt	mono	C/R	2,3,14
	1	no lip	qt	mono		
H. Kennedy Barrowfield Pottery Glasgow	6	complete	pt	duo	C	0,3,4,28,32,37
	1	complete	pt	duo	C/R	7
	1	no lip	pt	duo		36
	3	complete	pt	mono	C/R	10,28
	1	base frag	pt			2
	1	complete	qt	duo	C	38
J. MacIntyre & Co. Liverpool	2	complete	pt	duo	C	2,3
	1	no lip	pt	duo		2
Murray & Co. Glasgow	3	complete	pt	mono	C/R	1,5,13
	1	complete	pt	duo	C	14
	3	base frag	pt			1,4,16
	1	complete	qt	mono	C/R	5
	1	no lip	qt	duo		
Port Dundas Pottery Co. Glasgow	4	complete	pt	mono	C/R	O,T,W,Y
	1	no lip	pt	mono		
	3	base frag	pt			L
	1	complete	qt	mono	C/R	
	1	complete	qt	mono	C	
	1	no lip	qt	duo		T
	1	complete	qt	duo	C	T
Price Bristol	8	complete	pt	mono	C/R	B,C,L
	2	complete	qt	mono	C/R	B
(no mark)	12	complete	pt	mono	C/R	
	4	complete	pt	duo	C	
	3	complete	pt	duo	C/R	
	11	neck frag				
	13	base frag				
	1**	neck frag		duo		

Notes on Table B.01:

- * In profile, the lip finish and neck area of this bottle is wider than any other pint sizes, giving a stocky appearance. The wall of the collar is 1/4 inch thick at the top; the inside rim (mouth) diameter is 11/16 inch.

The lip finish on this ochre-colored fragment is unlike any of the plain broad collar-types with rings that are standard throughout the N-5 collection. Rather, this artifact is very similar if not identical to the more acutely angular collar and ring finish present on one of the "square" shoulder stoneware bottles found on the steamer **Bertrand and classed by Switzer as Subtype ld (1974:12).

BRIEF HISTORIES OF POTTERIES

Campbellfield, Glasgow:

Located on rich claybeds, the Campbellfield Pottery was involved primarily with brickmaking in the early nineteenth century. In the early 1870s, however, proprietor William Wilson began the manufacture of stoneware bottles using imported (English) buff clays (Quail 1974:2).

Davidson, Glasgow

Thomas Davidson was primarily a clay tobacco pipe manufacturer who took over the small Crown Pottery on Garngadhill in 1867 (King, personal communication).

Grosvenor, Glasgow

F. Grosvenor built the Bridgetown Pottery in 1869 for making stoneware articles such as chemical wares, bottles for various uses, and spirit-jars. He was previously a partner in the Caledonian Pottery at Glasgow before it relocated in Rutherglen in 1870 (Jewitt 1883:621, 623).

H. Kennedy Barrowfield Pottery, Glasgow

Henry Kennedy established the Barrowfield Pottery in 1866 to produce "glass-lined stoneware bottles and jars" for both home and foreign markets (Jewitt 1883:621-22). The "glass-lined" feature simply indicated that the stoneware bottles were glazed on the inside as well as out, and thus were suitable for storage of all liquids and easily cleaned for re-use. A good representation of the duotone stoneware beer bottles being discussed in this class is part of a trademark employed by Kennedy (Godden 1964:369), but it appears to be of the transfer-print variety rather than one that would be impressed. The date of registration of the mark is not mentioned, but such registrations commenced in Britain in 1875.

J. MacIntyre & Co., Liverpool

James MacIntyre became sole proprietor of his pottery shortly after 1852, and in subsequent years he prospered as the inventor of new manufacturing processes and kinds of ware. The firm continued to market goods under the same name following the founder's death in 1868 (Jewitt 1883:621).

Murray & Co., Glasgow

The Caledonian Pottery was established at Glasgow in the late eighteenth century and acquired about 1825 by Murray & Co. In 1870 the works were removed to nearby Rutherglen, but it is possible that "Glasgow" was not immediately removed from the pottery stamps for export ware.

Port Dundas Pottery Co., Glasgow

Founded in the early nineteenth century, this works was primarily concerned with producing salt-glazed stoneware vessels and water pipes until 1856. In that year, the proprietor, James Miller, introduced the shiny dip glaze that had been perfected at Bristol and which gave their ware the desired cream-colored appearance. The Port Dundas pottery was one of the largest in the Glasgow region and the first to adopt steam power to the turning of potter's wheels (Jewitt 1883:620-21). The potter's code letters itemized in Table B.01 for this pottery appear outside the border of the impressed oval stamp.

Price, Bristol

According to Jewitt, J. and C. Price and Brothers, and succeeding generations of the same family, operated the oldest stoneware pottery in Bristol, England, starting about 1735-40. Their salt-glaze operation was altered in 1842 to the liquid dip-glaze technique, developed by another

Bristol pottery in the 1830s. The superiority of "Bristol stoneware" over others became so well established that other "metropolitan" potteries bought their glaze from Bristol (1883:232-233). It should be noted that of the several stoneware beverage bottles recovered from the 1865 collection in the Bertrand, only one was marked with a manufacturer's stamp, viz., "Price Bristol". The mark however is in the form of two parallel lines rather than a circle as in the N-5 specimens, and the acutely round shouldered, duotone Bertrand examples are quite unlike the uniformly monotone and unshouldered bottles of N-5 (Switzer 1974:13).

BEVERAGE BOTTLES--GLASS

This broad class of bottles is represented by 95 complete or fragmentary specimens, all of which, for one reason or another, are believed to have been used to commercially distribute beverages, i.e., liquids other than water consumed for food or pleasure. They generally have tall, slender, cylindrical forms with neck portions equal to at least one-third the maximum height of the complete bottle. All complete bottles exhibit lip finishes that are separately applied to the neck, as opposed to being formed in the mold.

The great majority of lip finishes in the class consist of a broad collar with narrow ring below, commonly known in the glassworks trade as a "brandy finish" or "wine finish" (see Figure B.02). The narrow ring portion is predominatly of triangular vertical section among the examples in the collection, but a few of semi-circular and square vertical sections are also present. Corks, secured with wire, are in evidence, and they were undoubtedly the standard closure for these bottles.

Glass colors range from dark olive-greens or olive-ambers (black glass) to aquamarine, greens, and shades of amber.

Evolution of the cylindrical beverage bottle from seventeenth century English free-blown, globular precursors to the mid-nineteenth century piece-molded examples in N-5 is carefully traced by McKearin and Wilson (1978:209-220). The functional divisions that bottle collectors have traditionally assigned to particular morphological or embossment identified types (e.g., beer, spirits, whiskey, wine) are also covered in an introductory and pictorial manner by Wilson & Wilson (1968), Martin (1973), Munsey (1970), and Ketchum (1975).

DESCRIPTIVE DETAILS

The beverage bottles in N-5 are subclassified according to (1) glass color (black glass); (2) embossments (ale and whiskey); and (3) common names of morphological types used in the bottlers' trade, as identified by comparison of examples with illustrations and descriptions in glassware catalogs of the period 1875-1887.

Black Glass

This group of bottles stands as a sub-class primarily on the basis of its glass color, and an attendant crudity of manufacture, especially in the neck area and applied lip-finish. The glass appears black in reflected light, but transmitted sunlight reveals true coloration to be dark olive-green to olive-amber. This is an intentional feature, achieved by incorporating ashes or clay-slate into the glass batch (McKearin and Wilson 1978:10).

All examples were blown in three-piece molds that in some instances were full size and formed the body, shoulder, and entire neck portions; in other examples, the mold formed only the body and shoulder with most of the neck (and applied lip finish, of course) being formed outside the mold by the glass worker. Mass production of these uniform-capacity beverage bottles is believed to have originated with the invention of a revolutionary method and apparatus patented in 1821 by Henry Ricketts of the Phoenix Glass Works in Bristol, England (Ibid.:216). None of the N-5 examples, however, exhibit the flat embossed rimmed bases characteristic of the Ricketts' patent. Bases instead range from a mildly shallow depression covering the entire base, to deeply domed and conical depressions with generally rounded basal rims. One large specimen has a flat basal rim surrounding a concave disc with central dot, but it is not embossed with any lettering. At the site of an 1874-78 oyster saloon in Sacramento, California, it is reported that "several of the black-glass bottles still bear labels from the B. Byass Company in London" (Praetzellis, Praetzellis and Brown 1980:10:18). In 1878, 150 barrels of Byass' ale in bottles (the bottles were packed in barrels for shipment) were imported into San Francisco (Steele 1879:575). Another black glass bottle of the type found in N-5 is pictured by Blumenstein, bearing an original label, "Wickes' Red Seal Sparkling Ale, Wickes & Co., Brooklyn" (1966:98).

At N-5, black glass bottles are represented by 13 specimens, 5 small bottles (12 oz. capacity), 4 large (24 oz.), 2 base fragments from the large size, and 2 neck fragments retaining original corks and metallic foil capsules from what appear to be the large size bottles (see Figure B.04). Additional details of these bottles are presented in Table B.02. (C = plain broad collar; C/R = collar with ring.)

TABLE B.02

BLACK GLASS BOTTLES

No. of Examples	Condition	MH X MD	Lip Finish	Full-Size or Partial 3-pc Mold	Base Marks
1*	complete	8¼ x2-3/4	C/R	Partial	--
1	base frag	? x 2 3/8	?	?	N,S
1	complete	9-3/8 x 2-3/8	C	Full	--
2**	"	9-1/8 x 2½	C	Full	--
2	"	10¼ x 3-1/8	C/R	Partial	--
1	"	11-3/4 x 3	"	"	--
1	"	9-5/8 x 3-3/8	"	Full	--
1	base frag	? x 3	?	?	--
1	base frag	? x 3	?	?	M & M L'POOL
1***	neck frag	?	C	Full	?
1****	"	?	C	Partial	?

Notes on Table B.02:

* Profile identical to Switzer's Class I, Subtype 3c (1974:18).

** This is the only type that has a gradual sloping shoulder, as in a "champagne" style.

*** Metalic foil capsule covering wired cork closure is "gilded", with red embossed lettering. Dorsal surface reads, "J.H. BURNELL/ALBION (in script superimposed on beer barrel resting on side)/F.B. BURNELL". Lateral surface reads, "ALBION/ALE/ESTABD 1875/J.H. Burnell &Bro (in script)//BOTH CAPSULE/AND TRADE MARK/ARE PATENTED/IN THE UNITED STATES/TO IMITATE EITHER/IS FELONY". John H. Burnell and his brother Frederick Burnell were proprietors of San Francisco's Albion Brewery from 1879 to 1886, according to listings in Langley's **San Francisco Directory** indicating that this ale in a black glass bottle was most likely of local production.

**** Metallic foil capsule covering wired cork closure with red embossed lettering. Dorsal surface reads, "WELLPARK BREWERY/J & R Tennent (in script surrounding large 'T')/TENNENT'S/PALE ALE". Lateral surface reads, "BOTTLED BY/THE BREWERS/J. & R. TENNENT".

Black Glass

This group of bottles stands as a sub-class primarily on the basis of its glass color, and an attendant crudity of manufacture, especially in the neck area and applied lip-finish. The glass appears black in reflected light, but transmitted sunlight reveals true coloration to be dark olive-green to olive-amber. This is an intentional feature, achieved by incorporating ashes or clay-slate into the glass batch (McKearin and Wilson 1978:10).

All examples were blown in three-piece molds that in some instances were full size and formed the body, shoulder, and entire neck portions; in other examples, the mold formed only the body and shoulder with most of the neck (and applied lip finish, of course) being formed outside the mold by the glass worker. Mass production of these uniform-capacity beverage bottles is believed to have originated with the invention of a revolutionary method and apparatus patented in 1821 by Henry Ricketts of the Phoenix Glass Works in Bristol, England (Ibid.:216). None of the N-5 examples, however, exhibit the flat embossed rimmed bases characteristic of the Ricketts' patent. Bases instead range from a mildly shallow depression covering the entire base, to deeply domed and conical depressions with generally rounded basal rims. One large specimen has a flat basal rim surrounding a concave disc with central dot, but it is not embossed with any lettering. At the site of an 1874-78 oyster saloon in Sacramento, California, it is reported that "several of the black-glass bottles still bear labels from the B. Byass Company in London" (Praetzellis, Praetzellis and Brown 1980:10:18). In 1878, 150 barrels of Byass' ale in bottles (the bottles were packed in barrels for shipment) were imported into San Francisco (Steele 1879:575). Another black glass bottle of the type found in N-5 is pictured by Blumenstein, bearing an original label, "Wickes' Red Seal Sparkling Ale, Wickes & Co., Brooklyn" (1966:98).

At N-5, black glass bottles are represented by 13 specimens, 5 small bottles (12 oz. capacity), 4 large (24 oz.), 2 base fragments from the large size, and 2 neck fragments retaining original corks and metallic foil capsules from what appear to be the large size bottles (see Figure B.04). Additional details of these bottles are presented in Table B.02. (C = plain broad collar; C/R = collar with ring.)

TABLE B.02

BLACK GLASS BOTTLES

No. of Examples	Condition	MH X MD	Lip Finish	Full-Size or Partial 3-pc Mold	Base Marks
1*	complete	8¼ x2-3/4	C/R	Partial	--
1	base frag	? x 2 3/8	?	?	N,S
1	complete	9-3/8 x 2-3/8	C	Full	--
2**	"	9-1/8 x 2½	C	Full	--
2	"	10¼ x 3-1/8	C/R	Partial	--
1	"	11-3/4 x 3	"	"	--
1	"	9-5/8 x 3-3/8	"	Full	--
1	base frag	? x 3	?	?	--
1	base frag	? x 3	?	?	M & M L'POOL
1***	neck frag	?	C	Full	?
1****	"	?	C	Partial	?

Notes on Table B.02:

* Profile identical to Switzer's Class I, Subtype 3c (1974:18).

** This is the only type that has a gradual sloping shoulder, as in a "champagne" style.

*** Metalic foil capsule covering wired cork closure is "gilded", with red embossed lettering. Dorsal surface reads, "J.H. BURNELL/ALBION (in script superimposed on beer barrel resting on side)/F.B. BURNELL". Lateral surface reads, "ALBION/ALE/ESTABD 1875/J.H. Burnell &Bro (in script)//BOTH CAPSULE/AND TRADE MARK/ARE PATENTED/IN THE UNITED STATES/TO IMITATE EITHER/IS FELONY". John H. Burnell and his brother Frederick Burnell were proprietors of San Francisco's Albion Brewery from 1879 to 1886, according to listings in Langley's **San Francisco Directory** indicating that this ale in a black glass bottle was most likely of local production.

**** Metallic foil capsule covering wired cork closure with red embossed lettering. Dorsal surface reads, "WELLPARK BREWERY/J & R Tennent (in script surrounding large 'T')/TENNENT'S/PALE ALE". Lateral surface reads, "BOTTLED BY/THE BREWERS/J. & R. TENNENT".

Ale (Embossed)

This sub-class is represented by one specimen, a basal fragment in dark lime-green glass. Fragment is cylindrical, 2½ inches in diameter, 3 inches in height at tallest fracture point, with a deep conical depression in the base with rounded rim. Embossing on opposing faces reads, "(in outline circle) SWAN BREWERY Co./XXX ALE//THIS BOTTLE/NEVER SOLD/BY THE CO." (cf., Martin 1973:49).

Whiskey (Embossed)

This sub-class of beverage bottles is represented by four specimens: one complete, two with the upper portions of neck missing, and one central body fragment. All are identified by embossing to have contained "J.H. Cutter Old Bourbon" whiskey. Bottles are made of amber glass, cylindrical, 5th-gallon size, with long cylindrical neck tapering slightly toward top, round shouldered and concave disc in the base with flat rim.

Type 1: This complete specimen is 11 3/4 x 3, and has an applied collar and ring lip, and is embossed within a 4 3/8 inch diameter outline circle, "J.H. CUTTER/OLD/BOURBON/(crown)/A.P. HOTALING & CO./SOLE AGENTS". The mold is basically 2-piece, full-size, but a fine seam line running horizontally at the junction of body and shoulder indicates that separate half-cylinder plates were inserted in the body area of each mold piece--most likely an innovation to cut costs in providing custom-lettered molds (see Figure B.05). This bottle is pictured and described in Wilson & Wilson (1968:56,58) as bottle #8.

Type 2: Body fragment with most of neck portion missing. Same as Type 1 with additional embossing around shoulder on opposing side, "A No 1.".

Type 3: Body fragment, most of upper neck missing. Remaining fragment is 9½ x 3, embossed within 1 5/8 inch circle, "J.H. CUTTER/OLD/BOURBON/(small flying bird)", and below, "J.H. CUTTER/OLD/BOURBON/(whiskey barrel with initials 'J.H.C.')/TRADE (crown) MARKS/C.P. MOORMAN/MANUF./LOUISVILLE KY./A.P. HOTALING & CO/SOLE AGENTS", and within a 1 7/8 inch diameter circle on the reverse shoulder, "CUTTER/OK/WHISKEY". This bottle was blown in a 2-pc full-size mold, and there is no evidence of inserted lettered plates. Also present in the collection is a small central body fragment with enough embossing (bird, barrel, etc.) to positively identify it as this type. The bottle is pictured and described in Wilson & Wilson as bottle #5 (1968:57,58).

Oval Flasks

Illustrations in glassware catalogs identify the forms in this sub-class. Called "Pocket Flasks" by Hagerty Bros. (1876:244), they are more descriptively referred to as "Oval" flasks by Baker Bros. (1882:41), reflecting the basic geometric shape of a horizontal section of the bottle anywhere below the neck. Oval flasks that are blown in molds with plain curved narrow sides are termed "Plain Ovals", while those with flattened or banded narrow sides are called "Union Ovals". All oval flasks have relatively short necks.

Plain Oval: Represented by three specimens, amber, 2-pc mold. A complete example is 7 3/8 x 3 3/4 x 2 capacity of 13 oz., applied bead finish. Another example is missing the lip finish; and the third example is a neck and shoulder fragment with double-ring finish (see Figure B.06). All represent the size designated as "Pint" in the glassware catalogs.

Union Oval: A single specimen, amber, complete, 6 x 3 1/8 x 1½, capacity of 6½ oz. ("½ Pint"), double-ring finish (see Figure B.07).

Wines or Brandies

Differing in several respects from the classic, thin-walled, "kick-up" base wines and champagnes treated in Chapter 6, this form of bottle is nevertheless identified in the glassware catalog of A.G. Smalley of Boston in 1887 as "Wines, or Brandies" (1887:53); and in earlier trade lists, the illustrated and described shape is referred to as "Wine Bottle...best American make" (Hagerty Bros & Co. 1876:238-9) and "Dark Wine Bottles" (Whitall, Tatum & Co. 1876:45). They are cylindrical, with long necks and applied collar and ring lip finishes, very similar in size and proportion to the bottles identified above by their embossing as containing whiskey for distribution by Pacific Coast agents. Thus, the "American wine bottle" was the probable model for the famous embossed whiskey "fifth" that flourished throughout the western states during the booming 1870s and '80s.

All four examples are dark green in color, have shallow to medium dome-shaped depressions in the base; capacity of 24 oz.

Type 1: One example, 11¼ x 3¼, 3-pc mold; 3/4 inch deep dome-shaped depression in base with rounded rim.

Type 2: Three examples, 10½ x 3 1/3, ¼-inch deep dome-shaped depression in base with flat rim. There are no mold seam marks on these bottles, and they may represent a type similar to the "Imported, Seamless" fifth-size in dark green glass offered by Smalley (1887:53).

Export Lagers

The vast majority of N-5 beverage bottles are morphologically equivalent to a form illustrated in the bottlers' ware section of A.G. Smalley's catalog and described as "Export Lagers" in light green, dark green, or amber 13-14 oz. "pints" and 23-24 oz. "quarts" (1887:48-49). "Lager Beers" were also offered in 1875 by Wm. McCully & Co. of Pittsburgh in 6-to-the-gallon "quarts" and 12-to-the-gallon "pints", extra heavy and tempered, in amber glass (Innes 1976:227) (See Figures B.08a & B.08b).

In its labeled or unembossed condition, this form resembles a mid-twentieth century tall, disposable beer bottle. The cylindrical bottle has a flat, conical shoulder, gently leaving the body portion and joining the base of the neck both at about a 45° angle. The diameter of the bulbous neck, where it meets the shoulder, is almost double that of its joining the applied lip. Many colors of glass were employed, judging from the variety present in the N-5 collection; and several manufacturer's marks appear on the bases.

A detailed listing of the N-5 Export Lagers are given in Table B.03 below. (C=plain broadcollar; C/R = collar with ring.)

TABLE B.03

EXPORT LAGERS

No. of Examples	Capacity	Color	MH X MD	Lip Finish	Mold Type	Base Marks	Condition
1	24 oz.	Aqua	11 5/8x3	C/R	2-pc	L G Co	complete
1	"	Amber	?x3	?	"	"	no lip
1	"	"	11 3/8x3	C/R	"	C & I	"
1	"	"	11 5/8x3	"	"	D S G Co	complete
7	"	"	?x3	?	"	C&I;DSGCo;5; A&DHC	no lip
2	"	OG	11¼x3	C/R	seamless	--	complete
2	"	"	?x3	?	"	--	no lip
1	"	Amber	10 5/8x3	C/R	"	--	complete
1*	23 oz.	"	?x3	?	2-pc	103	no lip
2**	20 oz.	Aqua	11¼x2 3/4	C/R	"	CC&Co	complete
3**	"	"	?x2 3/4	?	"	"	no lip
2**	13 oz.	"	?x2½	?	"	"	"
1	"	"	9½x2½	C/R	"	--	complete
7	"	"	?x2½	?	"	MGCo;LGCo	no lip
2	"	Amber	9½x2½	C	4-pc	C&I	complete
2	"	"	9 3/8x2½	C/R	2-pc	D.S.G.Co	"
1	"	"	9 5/8x2½	"	"	U	"
9	"	"	?x2½	?	"	DSGCo;A&DHC; 6;A;C&I	no lip
1	"	"	"	C/R	"	--	no base
6	"	"	"	?	"	LGCo;MGCo; LGCoL	no lip
7***	"	Green	9½x2½	C/R	3-pc	N;8;X;o	complete
3	"	"	?x2½	?	"	N;WN	no lip
1	"	OG	9½x2½	C/R	seamless	--	complete
2	"	"	"	C	"	--	"
1	"	"	?x2½	?	"	--	no lip

Notes on Table B.03:

- * Embossed near the basal margin of this neatly made bottle is "NET CONTENTS 23 OZ"--a good indicator that this is an intrusive artifact dating no earlier than the second decade of the twentieth century when federal regulation required a net volume inscription on glass containers.

- ** The "CC&Co" appears as an intertwining monogram on the base of these aquamarine glass "pint" and even smaller than usual (20 oz.) "quart" export lagers. The mark is acknowledged by Wilson & Wilson (1968:176) and Toulouse (1971:117) to correspond to that of Carl Conrad & Co. of St. Louis, Missouri, originator of the famous "Budweiser" brand of lager beer in the mid-1870s.

- *** These bottles exhibit an unusual, almost "foreign" collar and ring lip finish in which all surfaces are at right angles, yielding square and rectangular vertical sections of collar, channel, and ring.

London Gin

This single example would be sub-classed as an export lager except for one small detail of construction of the bottle which places it in a separate category. At a depth of ½-inch inside the lip finish is a slightly protruding ridge or shelf, created for the support of a ring of cork. The cork ring in turn accommodates and seals a glass-rod stopper, and is a characteristic closure for nineteenth-century English gin bottles. Hagerty Bros. & Co., illustrates and describes "London Gins" in fifths and sixths in light green glass (1876:239-240), and A.G. Smalley of Boston illustrates and describes the same form in 1887 as "Tom Gins" (1887:53). The N-5 specimen is 10 5/8 x 2 3/4; 3-pc mold; light green; applied C/R lip finish; capacity of 23 oz.; and base embossed, "B S".

BITTERS BOTTLES

The members of this class are actually no more than proprietary medicine bottles that include the word "bitters" as part of the commercial name, and the few examples found in the N-5 collection listed below should properly be considered as an addendum to Chapter 7 focusing on drug bottles. Nevertheless, the exceptional regard given this specialized group by the bottle-collecting fraternity has become somewhat of a phenomenon, and accordingly they receive a separate listing here.

Watson makes the observation that bitters, as bottled commercial entities, have come full circle over the past 250 years. Beginning with small bottles containing medicine with stomachic and/or flavoring properties, the size of the bottles increased as proportions of alcohol increased, and in most cases alleged medicinal value eventually became practically nonexistant (outside of the questionable value provided by the alcohol itself). With passage of the Pure Food and Drug Act of 1906 and resultant prosecution of manufacturers, bitters gradually fell into disfavor with the general public. National Prohibition witnessed a brief flurry of revival of wine tonic bitters, bitter wines, and medicinal bitters, which were promoted as remedies but largely popular for their alcoholic base. After repeal, the demand for beverage bitters again fell off, and many manufacturers went out of business. Today there are only a few brands of bitters on the market, and these are principally for flavoring and stomachic use, and are sold in relatively small bottles (1965:14-15).

McKearin and Wilson also observe that prior to the last half of the nineteenth century, bitters were packaged mainly in standard medicine bottles, vials, and small utilitarian bottles. These bottles of several-ounce capacity were commensurate with the normal dose of a few drops to a teaspoonful. But at mid-nineteenth century, a natural side effect of the temperance movement was an increased production and consumption of liquid medicines in which the principal liquid was wine, whiskey, brandy, or other spirits. Doses moved from drops and teaspoonfuls toward tablespoonfuls and wineglassfuls. Along with increased demand for these "beverage" bitters, market forces increased competition between existing and newly created brands. A wide variety of bottles ranging in capacity from one to two pints and appearing in many different patented shapes were distributed throughout the nation in huge quantities. Usually an embossed inscription identified the bitters, colors were predominantly the ambers, and tall, square bottles with chamfered corners were the most commonly employed (1978:300-302).

Five brands of bitters are represented by seven bottles in the N-5 collection, indicated as such by embossed inscriptions. Some are fragmentary, but large enough for identification of original shape, size, and contents. Shapes are cylinders and tall squares. Colors are primarily shades of amber, with one each in olive green, aquamarine and flint (colorless).

DESCRIPTIVE DETAILS

All examples of the class are embossed with inscriptions that identify them as containing bitters preparations. The inscriptions are either explicit and contain the word "bitters", or they exist as a proprietor's name or monogram that has been previously observed on identical bottles with original paper labels that confirm the contents as bitters. Bitters bottles are therefore sub-classified according to proprietary embossing, using conventional descriptive terms and abbreviations.

Baja California Damiana Bitters

This single specimen is basically cylindrical with one-inch wide planar surfaces on two opposing sides that accommodate the embossed wording, reading down, "BAJA CALIFORNIA/DAMIANA BITTERS" (see Figure B.09a). An 8-rayed star-like figure is embossed in the center of the concave disc in the base. Most of the neck and all of the lip finish are missing. The remaining fragment is 9¼ x 2 3/4; bluish aqua; 2-pc mold. The flat surfaces containing the embossed wording appear to be formed by lettered plates separately incorporated into the basis cylindrical bottle mold. Mold variants and brief notes on the commercial history of the product are given in Watson (1965:94) and Wilson & Wilson (1969:24).

Dr. J. Hostetter's Stomach Bitters

Embossing appears on one face of this square bottle with chamfered corners, reading down, "DR. J. HOSTETTER'S/STOMACH BITTERS" (see Figure

B.09b). Most of the lip is missing but appears to be an applied, oil finish. The base is embossed, "A & D.H. C." in an arc surrounding the letter "B". Existing fragments are 8½ x 2 5/8; amber; 2-pc mold. Some 40 mold variants of this image-setting leader of the nineteenth century bitters industry are pictured and described in Wilson & Wilson (1969:36-41). An extensive history of the product is related by Young, including the statement that "...in 1853 the first bottles of the Celebrated Stomach Bitters (Hostetter's) were made at Pittsburgh, a city close to the sources of Monongahela rye" (1961: 127). Two specimens; capacity =20 oz.

Kennedy's East India Bitters

This single specimen is a relatively heavy-walled, square bottle in flint glass, 8 7/8 x 2 7/8, with an indented panel 4½ x 1 5/8 on the same side as the embossing, reading horizontally, "KENNEDYS/EAST INDIA/BITTERS/(panel)/ILER & Co/OMAHA NEB". Blown in a 2-pc mold, the short neck has an extract lip finish. The Omaha City Directories for 1874 and 1888 show Joseph D. and Peter E. Iler (Iler & Co.) as distillers and manufacturers of Kennedy's East India Bitters.

Dr. J G B Siegert & Hijos

The bottle is cylindrical, olive green in color, 3-pc mold, and is without its neck; the remaining fragment is 5½ x 2 3/8. A complete specimen pictured by Blumenstein (1966:42) possesses a brandy finish with sharp basal edges on both collar and ring, and a total height of 8 1/8. Embossing reads around the shoulder on the N-5 example, "DR J G B SIEGERT & HIJOS.", and around the concave disc on the base, "DR SIEGERT/CD BOLIVAR". According to the paper label on a modern counterpart of this product, **Angostura Aromatic Bitters** was originated by Dr. Siegert in 1830 in the Venezuelan town of Angostura, renamed Ciudad Bolivar in 1846. Besides primary recommendations as a flavoring for beverages and foods, the fine print on the label still suggests its use as a stomachic (appetite stimulant) and for flatulence. Today the bitters is packaged in a diminutive 2-ounce bottle in Trinidad, West Indies, and it confesses to contain no angostura bark in its formula.

HUA (monogram)

Three large basal fragments of cylindrical bottles were recovered that exhibit a characteristic monogram embossed in the center of the concave disc of each base. The monogram is constructed of the superimposed and intertwined letters, "H", "U", and "A". The tallest fragment is almost devoid of a neck, but enough glass is present above the shoulder to indicate that an expanded or bulbous neck existed in the complete bottle. The fragment is 7 x 2½; amber; 3-pc mold. The other two basal fragments represent the lower ½ to 1/3 of the body section, in shades of amber, and have essentially the same monogram embossing on the base. However, a variance in size of the monogram (from 3/4 inch to 1 inch in height of the largest letter, "U") indicates the use of different molds for each of the three specimens. Devner reports one of these bottles being found in Arizona with a partial label that reads, "Boonekamp of Maag-Bitter, H. Underberg-Albrecht" (1968:15); and Toulouse states that "Underberg's bitters is still being made...in Germany" (1971:509). Kendrick also reports the monogram on an amber pint bottle with an elongated bulging "Lady's Leg" neck and paper label that relates the same information (1965:15). Finally, "Boonekamp Bulb-Neck Bitters" bottles in amber, 4½ to the gallon capacity, at $16 per gross, are listed and illustrated under "Wine Merchants' Ware" in a Boston glassware dealer's catalog (Smalley 1887:53).

BLACKING BOTTLES

Found in quantity at N-5, both salt-glazed stoneware and glass bottles for liquid shoe or leather blacking were identified as to function by paper label remnants, embossing, and morphological comparison with trade catalog illustrations and descriptions. A total of 15 **glass** blacking bottles, all in aquamarine color, and 30 brown salt-glazed **stoneware** bottles, in three sizes, were collected. This functional group is sub-classified according to the obvious construction material difference.

SALT-GLAZED STONEWARE

None of the stoneware blacking bottles are marked with their manufacturer in any fashion. However, the unglazed interior clay color, the characteristic traits of having been hand thrown on the wheel and trimmed with templates, the texture and color of the salt-glaze, and the presence of portions of a blacking manufacturer's paper label (probably English) all strongly suggest British manufacture (see section on manufacture of stoneware beer bottles). Salt-glazed stoneware ink bottles possessing these same physical characteristics and impressed with the mark of an English pottery are common in the same N-5 context. Jewitt, writing in 1883 of this particular manufacturer, J. Bourne & Son of the Denby Pottery, emphasizes the worldwide demand for their vitreous (stoneware), salt-glazed ink, blacking, and other bottles (1883:357-58). American blacking bottle counterparts in white glazed stoneware are illustrated and described in three sizes in a late nineteenth century Akron, Ohio manufacturer's catalog (Covill 1971:241).

The stoneware blacking bottles are perfectly cylindrical from base to juncture with an acutely angular shoulder. The shoulder is narrow, quickly meeting the base of a wide, cylindrical neck with concave or corseted sides. The neck (outside rim) diameter is greater at the top than at its base, giving the relatively short neck a flared appearance. There is a high degree of standardization of form, color, and glaze within the entire group. Four sizes were found, but these vary little in proportions or finish (see Figure B.10).

All examples have a light brown-tone colored glaze, with buff to light gray unglazed or internal clay color. Wide, flat corks, averaging 1½ inch in diameter by ½-to-3/4 inch in height, were found inside several of the largest bottles, impregnated with the fine, jet-black powder intrinsic to blacking formulations.

Additional details and characteristics of the group are presented in Table B.04.

TABLE B.04

SALT-GLAZED STONEWARE BLACKING BOTTLES

No. of Examples	MH x MD	Condition	Capacity
16*	7½ x 3	complete	16 oz.
3**	? x 3	no neck	"
5	6¼ x 2 3/4	complete	10 oz.
6	5 x 2¼	"	5 oz.

Notes on Table B.04:

* One of these large bottles retains portions of its original paper labels. The word "DAY" in large black print against a wavy red-lined background may indicate an English proprietary brand, since "Day and Martin" blacking was a popular brand in Victorian England mentioned specifically in Charles Dickens' **Pickwick Papers.** Another black on white label on the reverse of the same bottle reads:

> "...(T)HE DIRECTIONS...OR USE...THE OTHER SIDE./ IT IS NECESSARY THAT THE /BLACKING SHOULD BE (WE)LL/ STIRRED BEFORE USING..." (surrounded by a black line boxed border).

** (2) Not shown in Figure B.10.

GLASS

Of the 15 aqua glass blacking bottles, all but two are of the standard tall, square form illustrated and described by Whitall, Tatum & Co. as a "Sponge

Blacking or Varnish" (1876:41; 1880:48). Two of the tall squares are embossed with proprietary information, as are a single cylindrical and single rectangular specimen.

Sponge blacking bottles (unembossed)

Eleven specimens; 4 3/4 to 5 x 1 3/4; NH = 1 to 1¼; IRD = 3/4; 2-pc mold; extract lip finish, capacity = 4 oz. The form is essentially the same as a wide-mouth French square prescription bottle; however, their stylistic origin is clear when compared with the crude, pontiled squares with embossing and/or original labels that indicate use by New England blacking manufacturers in the 1830s and '40s (Davis 1967: plates 41-44). Three examples retain the decomposed remains of the cork stopper, natural sponge and the 3-inch wire shaft that connected cork and swab to form an applicator unit.

Embossed blacking bottles

Alma Polish: Cylindrical; 3 5/8 x 2; NH = 3/4; 2-pc mold; flared lip (heavy); capacity = 3 oz.; embossed on opposing sides of domed shoulder, "ALMA//POLISH", and within a concave disc on the base, "C & Co/BOSTON".

Bixby Standard Dressing (See Figure B.11a): Square; 4 7/8 x 1 5/8; NH = 1 1/16; 2-pc mold; extract lip; capacity = 4 oz.; embossed on adjacent sides, reading down, "S.M. BIXBY & CO//STANDARD/DRESSING". The "X" of Bixby is double in size compared with other lettering, and noticeably falls in the center of that face of the bottle. A natural sponge swab remains inside the bottle.

Franco American Blacking Co (See Figure B.11b): Rectangular; deeply fluted corners; 5 1/8 x 1 3/4 x 1 3/8; NH - 1 3/8; 2-pc mold; extract lip; capacity = 3 oz.; embossed on one wide face in serifed letters, reading down, "FRANCO AMERICAN/BLACKING C$\underline{\text{O}}$". A sponge swab with long rusted wire shaft is still present, as is a small disc of cork pierced in the center with a short length of wire.

Jettine (see Figure B.11c): Square; 4 7/8 x 1 5/8; NH = 1 1/8; 2-pc mold; applied extract lip; capacity = 4 oz.; embossed on one face reading down, "JETTINE/ORVEL. HOLDEN & Co/CHICAGO".

COLOGNE, COSMETIC, AND PERFUME BOTTLES

At least fifty of the N-5 bottles originally held cosmetic preparations of various sorts. Many of the unembossed bottles described in the chapter on drug bottles may also have originally contained perfumes, colognes, or cosmetics, since glassware dealers sold their unembossed ovals, panels, French squares, and the like to small firms of all kinds. These in turn used paper labels or wrappers as the only means of identifying their product. It is therefore impossible, on the basis of bottle shape alone, to determine actual function. The bottles grouped together here, however, are identified by proprietary embossing or unusually characteristic morphology to be bona fide members of the class.

Among the identifiable cosmetic bottles are a number of brands widely used in the nineteenth century, including the still popular Vaseline. The bottles in this class have not been divided into morphological types, but are arranged alphabetically according to proprietary embossing. Unless otherwise stated, all examples are blown in two-piece molds and utilized cork closures.

EMBOSSED BOTTLES

Barry's Trichopherous (see Figure B.12)
One example; aqua; rectangular with chamfered corners; neck is missing--remaining portion is 4 x 2 1/16 x 1 3/16; embossed on sides reading down, "BARRY'S//TRICHOPHEROUS/FOR THE SKIN/AND HAIR//NEW YORK //DIRECTIONS/-IN THE-/PAMPHLET".

X. **Bazin, Philadelphia** (See Figure B.13)
One example; flint; wide mouth round; extract lip; 3 1/8 x 1 11/16; 2 oz.; NH = 7/8; embossed horizontally on side, "X. BAZIN/PHILADA". Bazin was a well known Philadelphia perfumer.

Chesebrough Manufacturing Co. Vaseline (See Figure B.14)
Six examples; flint; wide mouth rounds; three types:
Type 1: Four examples; 2 7/8 x 1 7/8; bead finish lip; NH = 7/8; IRD = 1; 2½ oz.; embossed horizontally on side, "(in arc) CHESEBROUGH MFG Co/VASELINE".

the existence of 47 different private-mold Florida Water bottles (embossed with proprietors' names). Of these, 12 are identified as being used by New York City manufacturers, and another 12 examples were bottled by as many different San Francisco perfumers (Moss 1968:42; see also entries under Crane & Brigham, and Redington).

To succeed as an imitation, a competitive Florida Water would have to duplicate closely the contents as well as the container and labeling. This problem appears to have been the most easily solved. By the latter nineteenth century, the perfume "Florida Water" was almost a generic entity, its formula appearing in several standard references. The usual procedure was to dissolve in alcohol specified quantities of oils of lavender, bergamot, lemon, curcuma, orange blossom, lemon balm, and rose (Wiegand 1884:1010). Most of these scents, with the addition of violet and spices, were revealed in flowery prose in an 1890s advertisement for Murray & Lanman's Florida Water (**Peterson's Magazine**, January, 1893). In addition, an early twentieth century recipe discloses the spices to be cinnamon and clove, substitutes jasmine for violets, and adds essence of musk (Hiscox 1909:514). This final ingredient, a "fixative" of animal origin, would lend the perfume a heavy, almost depressing odor--a quality that seems to have enjoyed a resurgence of popularity in contemporary society.

Although some advertising for Murray & Lanman's Florida Water gives the impression that the preparation originated in the year 1808, it is more likely that this date refers to the first appearance in New York City of a related individual--Robert I. Murray, a druggist at 313 Pearl St. (Longworth 1808). By 1817, Lindley Murray had joined Robert as an associate at the same stand; and in 1820 they were together at 263 Pearl at the corner of Fulton. Not until 1835, some six years after Robert Murray had retired from active practice, did Lindley Murray join talents with another druggist, David T. Lanman. The new partnership, Murray & Lanman, set up shop on the lower east side at 69 Water Street, two doors down from famous Old-slip Pier (Longworth 1835). But in less than a year, Murray & Lanman suffered a severe setback. On December 16-17, 1835, along with hundreds of other merchants, they lost everything in one of the most destructive fires the city had yet experienced. An account of the disaster shows, however, that the firm had removed within a short time to 145 Maiden Lane, just a few blocks outside the burned zone (Foster 1836). By 1837 they had rebuilt their old store at 69 Water Street, where they conducted their business successfully for the next ten years. At the end of the ten years, Murray had retired or deceased, and Lanman was running the drug store alone (Longworth 1837-1848). It is therefore probable that Murray & Lanman's Florida Water was developed and first offered for sale during the decade in which the two principles were effectively engaged as partners, i.e., 1837-1847. A surviving cover (envelope) for David T. Lanman & Co., dated 1857, lists Murray & Lanman's Florida Water, Bristol's Sarsaparilla, and Kemp's Worm Pastilles as the firm's proprietaries (Holcombe 1956:203).

About this time, Lanman took in as full partner an associate that had been in his employ since 1853, George Kemp, and the firm became known as D.L. Lanman & Kemp (Trow 1853, 1858). The drug business on Water Street had expanded to include a wholesale trade, and for production of their proprietary line, a laboratory was established at 36 Gold Street. Shipments of the Florida Water were being made by long ocean voyage to the Pacific Coast, and in San Francisco, S. C. Shaw at 138 Front Street was granted sole agency for California in 1860 (**California Pictorial Almanac** 1860). About 1863 Lanman retired from active participation in the business, and George Kemp took charge (U.S. Trademark 1094, statement, registered December 24, 1872). The firm name of Lanman & Kemp was retained in advertisement well into the twentieth century. Headquarters for the growing business were moved a few blocks north in 1871 to the corner of Wiliam and Cedar streets (Trow 1871).

Protection against fraudulent imitation of the Florida Water proved to be an ongoing battle, and it took the form of copyrights and trademarks registered with the federal government. The colorful label was copyrighted by Lanman & Kemp in 1869, and in 1880 their facsimile signature and representation of the mythical Egyptian phoenix were trademarked for the strip label used as a bottle neck band (U.S. Trademark No. 7830, registered February 17, 1880) (see Figure B.20). The legendary phoenix arising from its own ashes seems a proper symbol for Lanman & Kemp, in light of the rapid recovery its predecessor made from the disasterous conflagration 45 year earlier.

In 1898, partners in Lanman & Kemp were George W. and Edward Kemp, Edward Kemp Jr., and George Massey, at 68 William Street. They also maintained manufacturing and storage facilities at 82 Maiden Lane and 6 Liberty Street--all located only a few blocks away from where they began nine decades before (**Trow's Co-Partnership Directory** 1898).

Jesse Oakley & Co., New York (See Figure B.21)
One example; flint; round with flat shoulder; prescription lip; 3¼ x 1½; NH = 1 1/16; 1½ oz. Embossed within concentric outline ovals, "JESSE OAKLEY & CO/PERFUMERS/NEW YORK". Ground mouth for glass stopper.

Perine Guyot & Cie (see Figure B.22)
One example; flint; square with basal border on three sides of conical scallops; embossed on fourth side reading down, "PERINE/GUYOT/& CIE", 2 3/4 x 1 3/8; 3/4 oz.; extract lip; NH = 7/8. The number "1296" is embossed on the side to the left of the proprietary information embossed side, near the scallops. This may be a bottle design registration number.

Redington & Co. Florida Water (see Figure B.23)
Six examples; aqua; cylindrical; oil finish lip; typical Florida Water shape; embossed on side reading down, "FLORIDA WATER/REDINGTON & CO/SAN FRANCISCO"; two sizes and no complete specimens, but original complete size may be calculated from fragments. Large (2): 8 13/16 x 2 1/8. Small: 6 x 1 5/8, domed base with rounded rim.

St. Clair's Hair Lotion (see Figure B.24)
One example; cobalt blue; panel; 7¼ x 2 5/8 x 1 9/16; extract lip; NH=2; 8 oz. Embossed in single panel on wide face, reading down, "ST CLAIR'S/HAIR LOTION".

BOTTLES WITH NO PROPRIETARY EMBOSSING

High Oval Cologne
One example; flint; 4 3/4 x 1 5/8 x 1¼; oval body with concave shoulder and long neck; prescription lip; slight indentation at shoulder. This style is illustrated in Whitall, Tatum & Co. (1880:21) and Smalley (1887:22).

Fluted, Acorn Top Toothpowder

One example; flint; blow over screw top with brass, acorn finial-tipped screw cap; cylindrical with six vertical facets on 75 percent of circumference extending from rounded shoulder down to expansion near base. Basal portion is missing on this specimen, but form is readily identified as a tooth powder bottle, illustrated in Whitall, Tatum & Co. (1880:63). Remaining fragment is 3 3/4 (including cap) x 1 5/8; 3 oz.

Conical colognes

Two examples: flint.

Type 1: Long tapering form similar to a hock wine bottle; appears freeblown; 6 3/8 x 1 9/16; flare mouth; IRD = ½; concavity in base may be improved pontil scar; similar bottles pictured as cologne or perfume bottles in McKearin & Wilson (1978:407-08) and Ketchum (1975:124).

Type 2: Right circular cone with bulbous, pear-shaped expansion in upper third of bottle; 5½ x 2½; prescription lip; bulbous ring surrounding base; oval label panel situated vertically on side outlined with "rope" embossing; remainder of surface below pear-shaped expansion is covered with vertical rows of bumps similar to "corn on the cob".

FOOD AND CONDIMENT BOTTLES

At least 106 glass containers in the N-5 collection can be identified as bottles used for the commercial packaging of food and condiment products. Condiment bottles, such as spice, sauce, pickle, flavoring, and seasoning preparation types, comprise the vast majority of them. Because the N-5 bottles were deposited when tin cans were commonly used for the distribution of preserved foods, glass containers identified with preserved foods such as fruits and meats were generally absent from the site. Bottles for fruits and meats, however, were found in the **Bertrand** cargo which predates the N-5 site by approximately 20 years (Switzer 1974:44-55).

Although proprietary embossing indicate the original contents of some of the N-5 bottles, most examples are classified by comparing them with illustrations and descriptions in the nineteenth century glassware dealers' catalogs. The nomenclature presented in the catalogs for the various morphological types is therefore employed wherever applicable. Individual types are based on morphological variations within a sub-class, e.g., "Barrel Mustard" under the general sub-class, "Mustard Bottles"; or by proprietary embossing. Unless stated otherwise, all examples were blown in a two-piece mold, and utilized cork closures.

CLUB SAUCE

Lea & Perrins Worcestershire Sauce (see Figure B.25)

Eleven specimens; aqua; cyllindrical with long neck; applied lip appearing essentially as three adjacent rings with an inner shelf or ridge to support a cork sleeve. A glass rod stopper sealed contents by insertion through the cork ring. Embossed on side reading up, "LEA & PERRINS" and horizontally around shoulder, "WORCESTERSHIRE SAUCE". Base markings observed: "JDS" and "ACBCo". Two sizes: 8½ x 2½ (2 complete, 1 base fragment); 7 x 2 (3 complete, 5 base or base and neck fragments).

CAPERS

The pickled flower buds of Capparis spinosa, a garnish or seasoning, have been packaged in this tall, slender, green bottle to the present day. Smalley lists 6 and 12 oz. Fluted Capers (1887:44), and the traditional fluted sides and corners of the Square Caper in three sizes is illustrated in the Illinois Glass Co. catalog (1899:213).

Type 1 (see Figure B.26): Two examples (all or part of neck missing); green; largest fragment 7½ x 1 3/4 x 1¼; IRD = 7/8; all sides and chamfered corners are fluted; 6 oz.

Type 2 (see Figure B.27): One example (lip missing); green; remaining portion 8 3/4 x 2 x 1 3/4; the four corners are deeply fluted; IRD = 1 3/8; evidence of rectangular "slug plates" screwed into recesses in the mold on the opposing narrow sides. A very similar bottle is pictured in Zumwalt, embrossed on the narrow side, "THIE ROUNARD" (1980:354).

FLAVORING EXTRACT

Redington's Extracts (see Figure B.28)

One example; flint; 5 1/8 x 1 7/8 x 1; ball neck; extract lip; recessed panels on wide faces; embossed on flat narrow faces, "REDINGTON'S EXTRACTS"; corners fluted.

HORSERADISH

One of the common styles of bottles used to package this condiment in the nineteenth century was the same morphologically as a tall, wide-mouth round prescription bottle, and was cross-referenced as such in the 8 oz.-size by Whitall, Tatum & Co. (1876:44; 1880;45). The form is illustrated and listed in 6, 7, and 8 oz. by Smalley (1887:44).

Louit Freres (see Figure B.29)

One example; flint; 5 x 2¼; lip folded over on outside of neck; foil remnants around neck; bead or bank ¼" in height encircling base; glass-tipped pontil scar in concave depression in base; embossed on side reading up, "LOUIT FRERES"; 7 oz.; IRD = 1½.

S. K. & Co.

One example; aqua; 4½ x 2 7/16; applied bead finish lip; IRD = 1½; 8 oz.; embossed on side horizontally, "S. K. & CO.".

MUSTARD BOTTLES

The form of bottle called "Mustard" by late nineteenth century glass houses is a tall, rectangular bottle with chamfered corners and sloping shoulders that merge into a cylindrical neck. The wide sides and chamfered corners are fluted, with narrow sides flat (see Figure B.30). The lip is usually an applied or tooled bead finish. The form is unmistakably illustrated in Whitall, Tatum & Co. (1876:44, 1880:49) and available in ½- and 1-pound sizes. The form can be traced as far back as 1758 when a Philadelphia mustard maker included an illustration of the bottle in his newspaper advertisement (Mc Kearin and Wilson 1978:263). In addition to its primary function as a container for dry mustard (flour), "mustard" bottles were just as often used for other powdered or ground condiments. Switzer reports that 26 such bottles containing ground black pepper were found on the **Bertrand.** Zumwalt pictures several "mustards" bearing original labels of various San Francisco spice merchants which indicated contents such as sweet marjoram, cinnamon, allspice, cloves, and thyme (1980:46, 153, 187).

"Mustards"

67 examples (majority in fragments); aqua; two sizes: 7 x 2¼ x 1 7/16 and 6¼ x 2 x 1 1/8. Only 3 specimens of the smaller size, with one embossed on narrow sides reading down, "J. W. HUNNEWELL & Co//BOSTON" (lip missing).

Barrel Mustard (see Figure B.31)

One example; flint; 4½ x 2½; blow over lip; IRD = 1 5/8; traditional "barrel" shape with 3 "hoops" above and below embossing reading horizontally, "MOUTARDE DIAPHANE/LOUIT FRERES & Co"; beadlike collar at base and square band at mouth.

Imperial or French Pot Mustard (see Figure B.32)

Two examples; flint; cylindrical with disc-like foot at base; round shoulder meeting bulbous ring; cylindrical neck; lip folded over on outside of neck. **Type 1:** One example; 3 7/8 x 2 1/8; more than 3/4 of lip missing; glass-tipped pontil scar on base; embossed on side horizontally, "D & C". **Type 2:** One example; 4½ x 2 5/8; NH = 1¼; embossed on side horizontally, "F & Co".

Footed Vase-Shaped French Mustard (see Figure B.33)

Two examples; very pale aqua; tear or pear-shaped with thick, bevel-faced foot; wide, cylindrical neck with bulbous ring; lip folded over outside of neck; one side of body flattened to form oval plane for label; 4 7/8 x 2 3/4; base diameter = 2 1/8; NH = 1¼; base has traces of blowpipe pontil scar; remnants of metallic foil with red surface coloring around upper neck of one specimen. Nearly identical examples are identified as "mustard-type" (one embossed by French firm) by Zumbalt (1980:414, 447).

SQUARE PICKLE JAR (see Figure B.34)

Although the **Bertrand** cargo contained a varied assortment of elaborately attractive, Gothic-style, paneled pickle jars (Switzer 1974:50-57), N-5 yielded only one, barely ornamented example, 7¼ x 2 3/4; aqua; applied collar or packer lip; chamfered corners with a series of eight small depressions or dimples in the chamfering; depressed dome base with embossed letter "A"; IRD = 1 3/8. The absence of this bottle type may be due to the relatively fragile glass used in the large panels.

PEPPER SAUCES

E. R. Durkee & Co., New York

Type 1: One example (represented by a neck and base fragment); deep blue aqua; hexagonal, tapering from mid-body to a cylindrical neck 1½" in height; body is corrugated with series of 13 hexagonal bulbous rings, separated by intervening flat-faced recesses; near the base, one face of the hexagonal body is a flat plane for label; double ring lip; base is embossed in concave disc, "E.R. DURKEE/& Co/NY", and basal ring is embossed, "E.R.D.//& Co//PATD//FEB 17//1874". A complete specimen, pictured in Zumwalt (1980:129), would be about 8 inches in height; base MD = 2.

Type 2 (see Figure B.35): One example; aqua; neck missing; conical with entire body composed of series of 11 bulbous rings descending in diameter from base to neck and each ring ½" in height; base a smaller diameter disc forming a foot for the "beehive" body and is 2 3/4" in diameter. Base embossed, "E. R. DURKEE/& Co/NEW YORK". Complete specimen,

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G.C.O. (see Figure B.36)
One example; aqua; same ringed, corrugated surface as Durkee's Type 1 above, but body rectangular in section rather than hexagonal; 8¼ x 1 11/16 x 1½; 16 ribs with cylindrical neck and double ring finish; NH = 2¼; tapers from mid-body to base of neck; one wide side of lower body is occupied by a Gothic-arched recessed panel for label; embossed on basal rib on other 3 sides, "G.C.O.//PAT SEP. 28//.1875."; many dehydrated and blackened tiny peppers remain inside.

TABASCO SAUCE (see Figure B.37)
Four examples; aqua; cylindrical; 5¼ x 1 11/16; bead finish (one applied); angular concave shoulder leading to long neck; NH = 2; IRD = 5/8; 3 oz. Although the lip finish is different on these earlier examples, identification as tabasco sauce containers is based on the illustration of the form in the Illinois Glass Co. catalog (1899:214).

OLIVE OILS

Eleven examples, exclusive of many neck and other fragments that may be of this sub-class, were collected at N-5. Two specimens are identified by proprietary information impressed into applied shoulder seals, and the remaining 9 examples were typed according to their morphological comparison to the Smalley catalog illustrations (1887). All examples are tall, slender cylinders with long necks, similar to many wine bottles. No markedly deep basal depressions or "kickups" are present in this group, however. Walls of the bottle bodies are very thin.

Italian Olive Oils (see Figure B.38)
Three examples, none complete; aqua; 10½ x 2 1/8; characterized by widely flaring basal portion and acutely angular shoulder making short concave curve to base of neck; NH = 3½; packer lip; this type is also called in the trade, "Sweet", "Bordeaux", and "Bell" olive oil.

Marseilles Olive Oils

Four examples, none complete; aqua; characterized by straight sides with no flaring or bell-shaped base, and gently rounded or sloping shoulder; all differ in some regard as to lip finish and capacity.

Intermediate form

Two examples; combination of mildly flared base and rounded shoulder; neither are complete; 12 3/8 x 2½; extract lip (1 specimen); 1 each aqua and flint. Both are seamless (turned in mold to erase mold seam marks).

Ellwood Cooper, Santa Barbara, Cal (see Figures B.39a and B.39b)

Two examples (one missing neck); aqua; cylindrical with faintly flaring basal portion; 10 7/8 x 2 7/8; NH = 3½; gradual sloping shoulder; applied ring ¼" below sheared lip edge; applied seal on shoulder with oval impressed stamp 1 1/8 x 1 7/8 with wording reading horizontally, "ELLWOOD COOPER/PURE OLIVE OIL/SANTA BARBARA CAL"; domed depression in base with rounded rim.

ESSENCE OF JAMAICA GINGER (see Figure B.40)

Seven examples of these small, long-necked ovals were collected in N-5, all in aqua; 5 3/4 to 6 1/8 x 2 1/8 x 1 1/8 to 1¼; oil finish or double ring; all are embossed.

> "ABRAMS & CARROLL'S/ESS OF/JAMAICA GINGER/SAN FRANCISCO" (2 specimens).
> "LANGLEY'S/ESS/JAMAICA GINGER/SAN FRANCISCO" (1).
> "E.G. LYONS & CO/ESS/JAMAICA GINGER/S.F." (2).
> "McMILLAN/&/KESTER'S/ESS-OF/JAMAICA/GINGER/S.F.//S.F." (1).
> "TURNER'S/ESS OF/JAMAICA GINGER/NEW YORK" (1).

TROMMER EXTRACT OF MALT (see Figure B.41)

One example; amber; wide mouth oval; extract lip; 8 1/8 x 3 3/16 x 2 1/8; NH = 1 5/8; embossed on side reading down, "TROMMER/EXTRACT OF MALT CO./FREMONT OHIO", and on base in concave disc, "B B & C^{o}.".

VALENTINE'S MEAT JUICE (see Figure B.42)

One example; amber; egg-shaped with small base, neck missing, remaining portion 2 5/8 x 1 7/8; concave base; embossed horizontally on side, "VALENTINE'S (in arc)/MEAT JUICE".

INK BOTTLES--GLASS

A total of 21 glass containers in the N-5 collection are classified as ink bottles, i.e., bottles used to commercially distribute writing ink. Capacities range in size from ½ to 26 ounces; and all are blown in full-size piece-molds. Colors present are shades of aqua, green, cobalt blue, and flint (colorless).

Glass ink bottles are identified as to function by embossed proprietary information, or morphological comparison with nineteenth century glassware catalog illustrations of bottles designed to contain writing ink (Whitall, Tatum & Co. 1876, 1880; Baker Bros. & Co. 1882; A.G. Smalley 1887). In addition to the catalogs, much primary and comparative information was gained from Covill's book on ink bottles (1971).

The N-5 glass ink bottles are sub-classified according to their basic morphology, with proprietary embossing defining some types within a sub-class. In one instance, an example is sub-classified by the embossed patent information on a complex-shaped fragment. Contemporary nineteenth century glassmaker's nomenclature, as used in the trade catalogs, is employed if applicable to N-5 specimens. Unless stated otherwise, all examples were blown in two-piece molds and utilized cork closures.

PYRAMID INK STANDS (see Figure B.43)

Right pyramidal bottle of 8 sides with short cylindrical neck, redundantly described in some lists as "Fluted Pyramids", and called "umbrella inks" by bottle collectors. Capacity is 2 oz.

Six examples; aqua (4), flint (1), green (1); applied lip (1), infolded lip (1), tooled extract lip (3), lip missing (1); 2¼ to 2 3/4 x 2 1/8 to 2½; IRD = 3/8 to 7/16.

CONICAL INK STANDS

Right circular cone body with short cylindrical neck, with or without bulbous ring at shoulder. Capacity is 2 oz.

Plain Cone (see Figure B.44)

One example; aqua; 2 5/8 x 2½; extract lip; embossed horizontally on side, "L. H. THOMAS'/INK".

Ring Cone (see Figure B.45)

Four examples; aqua; 2½ x 2½; bead lip (1 applied); small secondary ring immediately above large bulbous shoulder ring; 1 example has third ring just below lip; two examples embossed in circle on base, "CARTER'S".

DOME-SHAPED INK STANDS (see Figure B.46)

Called variously in the trade catalogs, "Fluted Fountain", Monitor", and "Tea Pot Fountain" ink stands. Basically hemispherical with short cylindrical neck projecting upward from one side of the domed surface, and a slightly protruding band encircling the base to a height of 5/8 inch. Two-thirds of the circumference of the band is further molded into 6 equal, plane facets. Bottle collectors refer to this form as an "igloo ink". The top edge of the neck is sheared (blow over) and rough ground. Capacity is 2 oz.

Two examples; aqua; 1½ x 2 3/16; IRD = ½ inch; embossed on facets of basal band, "J/&/I/E/M"; one specimen is additionally embossed immediately above the facets on the dome surface, "PAT$\underline{\text{D}}$ OCT 31 $\underline{\text{ST}}$ 1865". Covill pictures a specimen of this bottle bearing an original label that reads, "MOORE'S/EXCELSIOR SCHOOL WRITING INK/MANUFACTURED BY J. & I.E. MOORE/WARREN, MASS." (1971:141).

CYLINDRICAL INK BOTTLES

Sanford's Ink

One example; 2¼ x 2 11/16; flint; inward curve at base and round shoulder; NH = 5/8; IRD = 9/16; flared lip with ORD = 1½; 3 oz.; embossed horizontally on side, "SANFORD'S INK". A similar specimen is pictured by Covill with the comment, "has a metal collar on the rim" (1971:78).

Carter's (see Figure B.47)

One complete example and one neck and lip fragment; dark aqua; 9 3/4 x 3 1/8; round shoulder; NH = 2 3/8; 26 oz., 3-pc mold; applied lip is a tall plain collar with ring below and a "pour-out" spout; embossed horizontally around shoulder opposite spout, "CARTER'S" in large square-serifed capitals.

(Not Marked)

One example; flint; 1 x 1¼; flat shoulder with short neck offset from center of bottle; NH = ¼; IRD = ½; blow over lip has fine ground top edge; ½ oz.

SQUARE INK BOTTLES

Square Carmine ink bottle (see Figure B.48)

One example; flint; 2 3/4 x 1 5/8; extract lip; NH = 3/4; 2 oz. This is essentially a tall square bottle with horizontally flat shoulder, and also with every right angled edge of the body chamfered to some extent. Cork is still in neck, and interior of bottle is stained with remnants of violet ink.

Square Ink Stand (see Figure B.49)

One example; deep cobalt blue; 2½ x 3; NH = ¼; IRD = 1¼; blow over lip with rough-ground edge; heavy, thick-walled box-like container with rusted remains of a cylindrical metal insert or "well" in the neck, extending down to the base.

MORGANS PATENT

One fragment; flint; embossed, "MORGANS P.../JULY 16 1867". The fragment represents about half of the entire container pictured in Covill as Figure 1310, and classified by that author as a "Fountain Inkwell" (1971:311). Basically an inverted dome-shaped reservoir connected by a tapering channel to an upright spout, the inkwell vaguely resembles a snail. The complete example has a 12-paneled dome two inches in height, and the length is 3 7/16. The top edge of the spout lip is a rough-ground blow-over type.

INK BOTTLES---STONEWARE

Twenty-eight examples are represented in the N-5 collection. They range in capacity from 3/4 to 28 fluid ounces. Most of the stoneware ink bottles are of the brown-tone salt glaze variety, typical of British manufacture, and all of the larger sizes (7 oz. and larger) are stamped with manufacturer, proprietor, or registry marks that confirm their English origin. Three specimens are finished in the off-white, transparent dip-glaze.

All examples are identified as to function by proprietor's impressed marks, or by comparison with identically shaped bottles bearing original ink makers' labels. The primary reference work used for stoneware ink bottles was Covill (1971), with some enlightment provided by the illustrations in Munsey (1970:138).

All stoneware ink bottles in N-5 were hand-thrown on the potter's wheel but as with British stoneware beers, free use was made of templates and other manual trimming and forming techniques to achieve final shape. Most forms are basically a cylinder, with conical neck and heavy collared lip; but a small one-ounce size is entirely conical. One large example of 16 ounce capacity is a unique, patented, shouldered-cone design.

Sub-classification of stoneware ink bottles is according to gross morphology, i.e., cylindrical and conical, with impressed marks forming the types within each sub-class.

CYLINDRICAL

J. Bourne & Son, Denby Pottery (see Figure B.50)

Brown-tone salt glaze; acutely angular shoulder and concavely formed neck, giving the appearance of a short cone sitting atop a tall cylinder. The heavy collared lip of rectangular vertical section flares slightly toward a flat top rim. Large, 7-line, impressed manufacturer and proprietor's mark is stamped on side near base and reads horizontally, "VITREOUS STONE BOTTLES,/J. BOURNE & SON,/PATENTEES./DENBY POTTERY,/NEAR DERBY. /(straight line)/P. & J. ARNOLD/LONDON".

Type 1: Four examples (1 complete); 9 x 3 3/8; 28 oz. Two specimens are missing lip portion. One neck and lip fragment reveals that the salt glazing penetrated down neck through mouth only 3/4 inch, and remainder of interior is unglazed.

Type 1a: Two examples (1 complete); 6 7/8 x 2 7/8; 13 oz. One specimen with no lip.

Type 1b: Five examples (3 complete); 5 3/4 x 2½; 8 oz.; 2 specimens with no lip. One complete specimen retains originial cork and partial ink (black) contents.

J. Bourne & Son, Denby & Codnor Park Potteries: Same general description as above with exception that fourth and fifth lines of impressed stamp read, "Denby & Codnor Park Potteries/Near Derby." Joseph Bourne of the Denby Pottery took over the Codnor Park works in 1833 and continued operations at both locations until 1861 when the latter was closed and workmen and plant were transferred to the Denby Works (Jewitt 1883:356).

Type 2a: One example (lip missing); ? x 3 (comparable to size of Type 1a.); 13 oz. Switzer reports 24 specimens of this bottle were found on the **Bertrand**, "...containing about 14 ounces of green ink, (and) stoppered with corks, and sealed with a gray putty-like material stamped 'ARNOLD/LONDON' " (1974:67).

Type 2b (see Figure B.51): Two examples (1 complete); 5 7/8 x 2 5/16; 8 oz.; one specimen with no lip.

Bourne & Son, Denby: Transparent glaze over light gray clay body; acutely angular shoulder, and concavely formed neck with a convex ring surrounding the neck 3/8 inch below a heavy bead finish lip. One portion of the lip has been pinched by hand from below and grooved from above to form a "pour-out" spout. Impressed manufacturer's mark on side near base reading horizontally, "BOURNE & SON/DENBY/DERBY".

Type 3: Two examples (one complete); 9 1/8 x 3 3/8; 27 oz. One example is a characteristically formed neck and lip fragment that reveals the glaze penetrating the interior of the bottle only to a level 1 3/4 inches below the top edge of the lip. Fingertip smudges near the basal margin of the complete specimen suggests that the bottle was grasped by the base and immersed into the liquid glaze in an inverted position, covering the exterior but forcing the liquid into the interior only to the level demonstrated on the fragment. At the time of Jewitt's writing, J. Bourne & Son were making ink bottles in both the patented vitreous stone (salt glazed) and the "white glazed" (1883:358).

Stephens, London: Light pinkish-brown salt glaze; steeply pitched conical shoulder atop cylindrical body, meeting at about a 60^{0} angle. Neck is square in horizontal section with a cylindrical bore or throat. Although the upper portion of the neck on this specimen is missing, a similarly constructed stoneware bottle is pictured by Munsey, showing that the entire neck portion exists as a cube sitting atop the conical shoulder (1970:138) and that the cylindrical throat exits through the dorsal surface of the cube and connects with a slightly protruding pour-out spout formed on a lateral face of the cubical neck. The four lateral faces of the cubical neck are extended partially or completely down the face of the conical shoulder, forming shallow, irregular facets. This complex geometrical design, completely fashioned by manual throwing and trimming, was patented in 1876, as disclosed by the diamond-shaped British registration mark impressed near the base of the bottle.

Type 4: (see Figure B.52) One example (missing lip); remaining portion is 6 5/8 x 2 3/16; 7 oz. Ink manufacturer's mark is impressed in a single line reading down one side of body opposite the registration mark, "STEPHENS 171 ALDERSGATE St. LONDON". Two examples of ink bottles, dissimilar in style to Type 4, but marked, "STEPHENS LONDON" are pictured and described in Covill (1971:80, 234).

(Not Marked): Brown salt glaze; low conical shoulder with short cylindrical neck; bead lip finish.

Type 5 (see Figure B.53): One example; 4½ x 1 3/4; 3 oz. This bottle is pictured by Covill as Figure 983 (1971:231).

Type 5a: Five examples; 1 7/8 to 2 x 1 3/4 to 1 7/8; 3/4 oz. These are pictured by Covill as Figures 968 and 970, the latter having a paper label of a New York ink manufacturer (1971:228,229).

CONICAL

T. Davids & Co., New York (see Figure B.54)

Transparent dip-glaze over cream-colored clay body. Basically a conical body, curving inward at base, with bulbous shoulder at 2/3 height from base that in turn tapers concavely inward to form a conical neck. Ringed neck pour-out spout lip as in Type 3. A diamond-shaped British registration mark is impressed near base of bottle, indicating that the design of the container was patented November 3, 1858. This appears to correspond to British Patent No. 116585, registered by James Stiff of London (Cushion 1976:305), and later (January 11, 1859) registered as U.S. design patent #1078 by T. Davids, N.Y.

Type 6: One example; 7 1/8 x 3 5/8; 16 oz. Adjacent to the two lower faces of the diamond-shaped registry mark is also impressed, "T. DAVIDS & Co/NEW YORK", representing the name of a U.S. ink manufacturer. This bottle is pictured and described by Covill in Figure 1018 (1971:240).

(Not Marked): Brown salt glaze; body shape is a right circular cone, bead finish lip with annular concavity immediately below, creating in effect a slight neck and shoulder. The shoulder exists either horizontally flat or mildly conical.

Type 7: (see Figure B.55): Four examples (two missing lip); 2 5/8 to 2 3/4 x $2\frac{1}{4}$ to 2 3/8; 1 oz. Fractured examples reveal that interiors are unglazed. Covill pictures these bottles in Figures 954 and 958, the latter bearing a paper label that reads, "ARNOLDS/SUPERIOR WRITING FLUID/MANUFACTURED BY/P. & J. ARNOLD/135 ALDERSGATE STREET, LONDON" (1971:226, 227).

MUCILAGE AND GLUE BOTTLES

Twelve examples represented in this class are identified according to function primarily by morphological comparison with nineteenth century trade catalog illustrations and descriptions. Photographs of identical bottles with original labels in a collectors reference book on the subject also aided in analysis of the class.

It is readily apparent from the catalogs that mucilage bottles and glass ink stands were frequently very similar in form (Whitall, Tatum & Co. 1876:16,43; 1880;48; Smalley 1887:42). Most of the large nineteenth century ink makers such as Carters Ink Co., Sanford Mfg. Co., Thaddeus Davids & Co., and William A. Davis also made mucilage, and it may be assumed that some bottles classed as mucilages were also used for ink at times. (Covill 1971:414). Nevertheless, certain morphological differences between mucilage bottles and ink stands allow a formal--if not always observed--distinction between the two classes of glassware.

Conical and pyramidal mucilage bottles have an expanded area at the base of the neck that takes the form of a wide dome, or a series of two or three bulbous rings of varying heights and diameters. This expanded area gives the mucilage bottle a "broad, heavy shoulder" not found on conical and pyramidal ink stands. Most of the N-5 mucilage bottles are multi-sided (known as "fluted" in the glass trade), with 8, 10, or 16 sides forming the pyramidal body. Smooth-sided cones were called "Bell Style" (Smalley 1887:42).

Mucilage bottles in the N-5 collection are subclassified according to their basic morphology, i.e., Bell Style or by number of sides, or by proprietary embossing when found on a typical forms. Unless stated otherwise, all mucilage bottles have a sheared and fire-polished lip finish. Such a top was normally fitted with a cap and brush assembly (Haggerty Bros. 1876:67; Smalley 1887:42). All examples were blown in a two-piece mold.

BELL STYLE (see Figure B.56)

One example; conical with a secondary cone and ring-shaped expansion that together form a shoulder 5/8 inch in height; 3¼ x 2½; IRD=11/16; aqua; 3 oz.

PYRAMIDAL MUCILAGE BOTTLES

Octagonal

Type 1: One example; aqua; shoulder formed by a bulging dome-shaped ring ½ inch in height; 3 1/8 x 2 3/8; NH = ½; 3 oz.

Type 2 (see Figure B.57): Three examples; aqua; shoulder formed of three bulbous rings totaling 3/4 inch in height; 3 x 2 7/16; NH = 7/16 to 9/16; 3 oz.

Type 3 (PEERLESS) (see Figure B.58): One example; aqua; shoulder is formed of two bulbous rings that total 5/8 inch in height; 3 x 2 3/8; NH = ½ inch; 2 oz.; embossed, reading down on two adjacent sides, "PEER//LESS".

Type 4 (see Figure B.59): One example; aqua; shoulder area consists of two disc-like rings above a concave annular area; 3 5/8 x 1 5/8; NH = ½; 2 oz.; 5-pointed star embossed on base; top edge of lip has rough, ground surface. The proportions of this mucilage bottle give it the appearance of a tall salt shaker, but Covill pictures similar containers embossed with ink manufacturers' names and identified as mucilage bottles (1971:417). A similar 8-sided, tall bottle bearing a label for "Pearl Mucilage" and fitted with a rubber applicator top is pictured in an advertisement for the product in an 1880s magazine (**Harper's Monthly** 1888).

Type 5: One example; flint (colorless); similar to Type 4, but area above concave annular ring is a bulging ring and an external screw-thread lip with rough, ground top surface; 3 3/4 x 1½; IRD = 11/16; base is embossed in a circle, "RICHARDS MNF'G CO/PATENTED". Lumps of dry, brownish-black, resinoid material remain in the bottle.

10-Sided

One example; very pale aqua; shoulder formed of bulging ring and dome combination ½ inch in height; 2 7/8 x 2¼; NH = ½; 3 oz.

16-Sided (see Figure B.60)

One example; aqua; shoulder formed of narrow bulging ring and dome combination 3/8 inch in height; 3 x 2 3/4; NH = 9/16; 3 oz.; a bulging ring 5/16 inch in height extends upward from the base to give it a round base.

Egyptian Tenexine (see Figure B.61)

One example; aqua; 4-sided pyramidal; plain round shoulder; 2 3/4 x 2 1/8; NH = ½; IRD = 5/8; 3 oz.; embossed on one side horizontally, "EGYPTIAN/TRADE MARK/(outline of 4-sided pyramid)/TENEXINE". Not of typical morphology, this bottle is classed as a mucilage pending further investigation of the trademark.

COOK'S LEATHER CEMENT (see Figure B.62)

One example; aqua; cylindrical; 2½ x 1; extract lip; ¼ oz.; NH = 5/8; embossed vertically reading down, "COOK'S/LEATHER CEMENT".

SNUFF BOTTLES

Snuff, a powder made from tobacco, is either inhaled (snuffed) through the nose or chewed. Moist snuff is called **rappee**, dry snuff is known as **sweet.** Scotch snuff, apparently the eighteenth century favorite in America, may have been imported in bottles before 1731, when a New York City merchant offered "very good Scotch snuff in Bottles" (McKearin and Wilson 1978:260).

The five snuff bottles in the N-5 collection are all of the same basic form, viz. rectangular with chamfered corners, tall, rounded shoulder, and a characteristic flared lip that arises directly from the shoulder, dispensing entirely with a neck. All are amber in color, blown in 2-piece molds, and identified by an illustration in Smalley's catalog as a style known as "Maccouba Snuff", available in ½ or 1 pound sizes (1887:40). Maccouba snuff bottles in the same sizes were also offered by Whitall, Tatum & Co. (1876:44; 1880:49). A colorfully labeled and corked "Maccoboy Snuff" bottle of the same basic shape, but probably of earlier manufacture (1846-51) is pictured by McKearin and Wilson (1978:plate VII); Mumsey shows a similar but differently labeled specimen (1970:78). The only significant variations among the five specimens in N-5 are minor size differences and base mold markings.

Type 1 (see Figure B.63): Three examples are 4 1/8 x 2 5/8 x 1 3/4; IRD = 7/8; ORD = 1 3/16; base has diagonal mold seam, no concavity, crude "X" or ".." marks.

Type 2: One example 4 1/8 x 2½ x 1 3/4; IRD = 1 1/8; ORD = 1 5/8; base has shallow concave disc with central dot.

Type 3: One example 3 7/8 x 2½ x 1½; IRD = 13/16; ORD = 1 1/16; base has concave disc 3/16 inch deep.

FIGURES

All bottle photography is by Edgar Torres, unless otherwise credited.

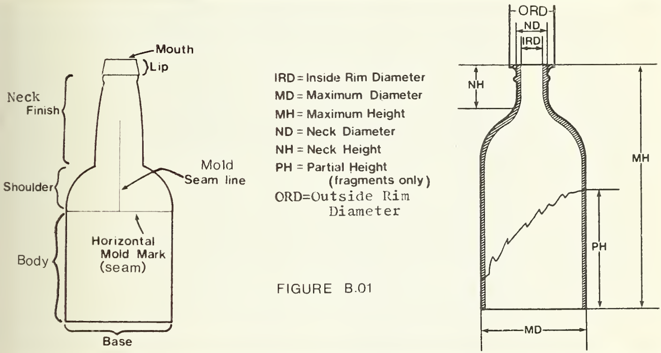
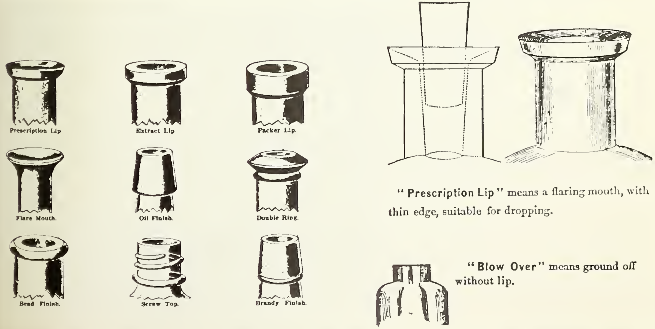


Figure B.01: Bottle Part Terminology
(adapted from White 1978: 63)

Figure B.02: Types of Lip Finish (From Putnam 1965: 20)



"**Prescription Lip**" means a flaring mouth, with thin edge, suitable for dropping.

"**Blow Over**" means ground off without lip.

MISCELLANEOUS BOTTLES

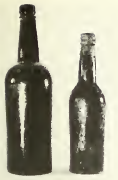


Figure B.04
Beverages-Glass
"Black Glass"
(Beer?)

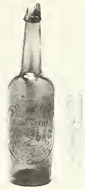


Figure B.05
Whiskey--
Type 1

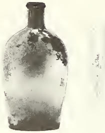


Figure B.06
Whiskey--
Plain Oval

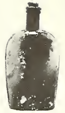


Figure B.07
Whiskey--
Union Oval

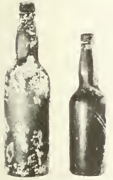


Figure B.08a
Beer--
Amber Export
Lager

Figure B.08b
Beer--
Aqua Export
Lager

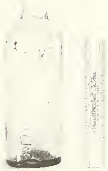


Figure B.09a
Damiana Bitters

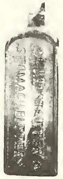


Figure B.09b
Hostetter's
Bitters

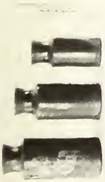


Figure B.10
Blacking--
Stoneware

Figure B.11a
Shoe Blacking--
Bixby

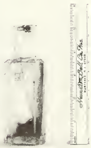


Figure B.11b
Shoe Blacking--
Franco-American

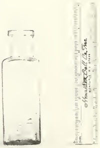


Figure B.11c
Shoe Blacking--
Jettine

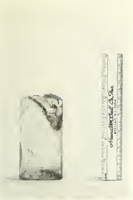


Figure B.12
Lotions--
Barry's
Trichopherous

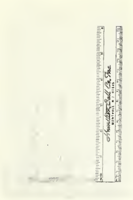


Figure B.13
Lotions--
X. Bazin

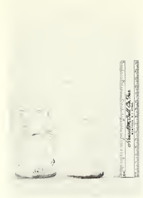


Figure B.14
Lotions--
Cheesborough
Vaseline

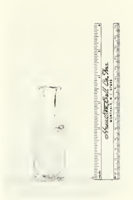


Figure B.15
Colognes--
Hoyt's German
Cologne

Figure B.16
Colognes--
Lubin Perfume

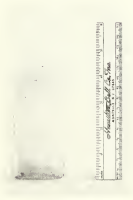


Figure B.17
Colognes--
Lyons

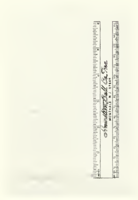


Figure B.18
Colognes--
Mitchell's
Centennial

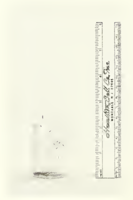


Figure B.21
Colognes--
Oakley Perfume

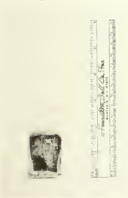


Figure B.22
Colognes--
Perine Guyot
Perfume

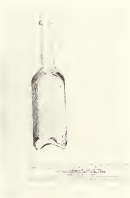


Figure B.23
Colognes--
Redington
Florida Water

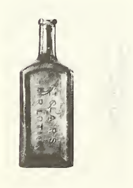


Figure B.24
Lotion--
St. Clair's
Hair Lotion

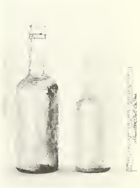
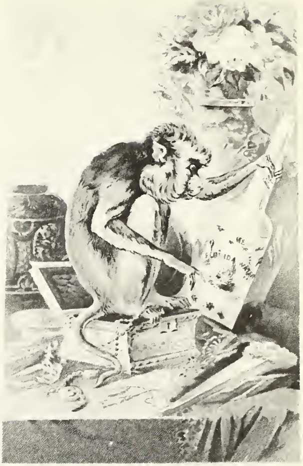
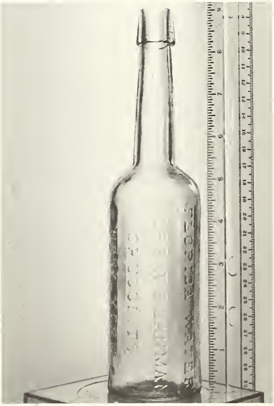


Figure B.25
Foods--
Lea & Perrins
Worcestershire



Figures B.20a and B.20b: Late Nineteenth Century Advertising Cards . . .for Murray & Lanman's popular "Florida Water", showing the spiralling paper label distinguishing the brand from its numerous competitors. Flowers, vitality, and romance were the associations conveyed by much of Murray & Lanman's advertising. (Frank Sternad)

Figure B.19: A Murray & Lanman Cologne bottle containing Florida Water (Frank Sternad)



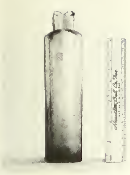


Figure B.26
Foods--
Capers,
Type 1

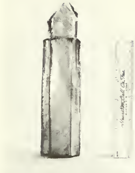


Figure B.27
Foods--
Capers,
Type 2

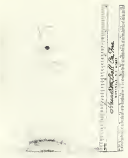


Figure B.28
Foods--
Redington's
Extracts

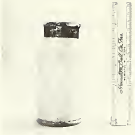


Figure B.29
Foods--
Louit Freres

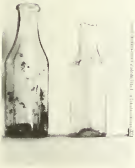


Figure B.30
Foods--
"Mustard"
(ground)

Figure B.31
Foods--
Mustard,
Barrel type

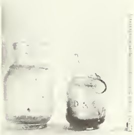


Figure B.32
Foods--
Mustard,
Imperial type

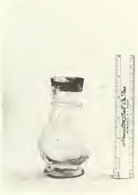


Figure B.33
Foods--
Mustard, Footed
French type

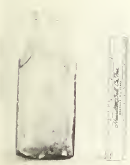


Figure B.34
Foods--
Pickles,
Square type

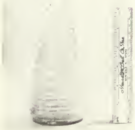


Figure B.35
Foods--
Durkee
Pepper Sauce

Figure B.36
Foods--
G.C.O.
Pepper Sauce

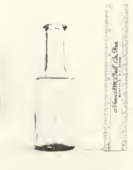


Figure B.37
Foods--
Tabasco Sauce

Figure B.38
Foods--
Italian
Olive Oil

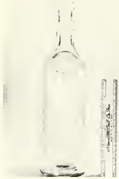


Figure B.39
Foods--
Elwood Cooper
Olive Oil

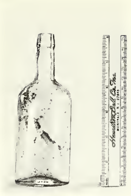


Figure B.40
Foods--
Essence of
Jamaica Ginger

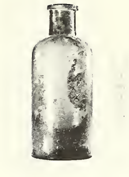


Figure B.41
Foods--
Trommer
Extract of Malt

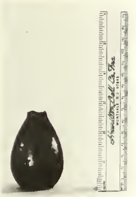


Figure B.42
Foods--
Valentine's
Meat Juice

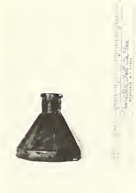


Figure B.43
Inks, glass--
Pyramid type

Figure B.44
Inks, glass--
Plain cone type

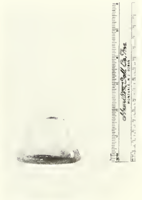


Figure B.45
Inks, glass--
Ring cone type

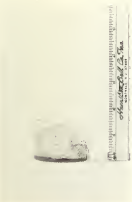


Figure B.46
Inks, glass--
Dome-shaped type

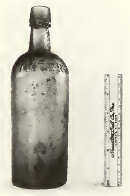


Figure B.47
Inks, glass--
Carter's

Figure B.48
Inks, glass--
Square carmine type

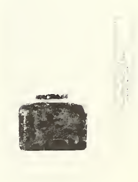


Figure B.49
Inks, glass--
Square ink stand

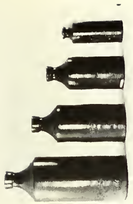


Figure B.50
Inks, Stoneware--
J. Bourne & Son

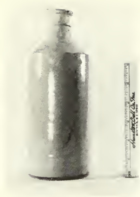


Figure B.51
Inks, stoneware--
Bourne & Son
Type 2B

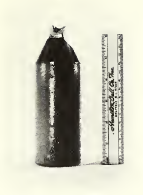


Figure B.52
Inks, stoneware--
Stephens, London

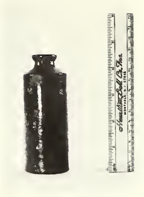


Figure B.53
Inks, stoneware--
Cylindrical type

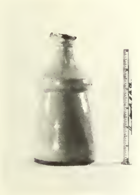


Figure B.54
Inks, stoneware--
Conical type
T. Davids

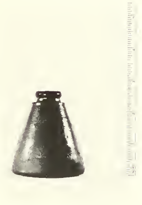


Figure B.55
Inks, stoneware--
Conical type 7

Figure B.56
Mucilage--
Bell type

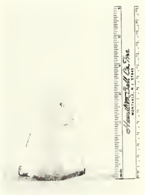


Figure B.57
Mucilage--
Octagonal,
Type 2

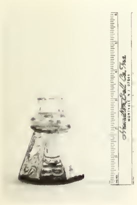


Figure B.58
Mucilage--
Octagonal, Type 3
(Peerless)

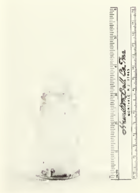


Figure B.59
Mucilage--
Octagonal,
Type 4

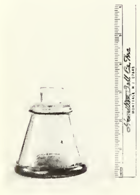


Figure B.60
Mucilage--
16-sided type

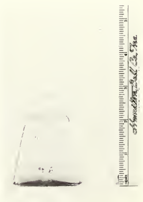


Figure B.61
Mucilage--
Tenexine

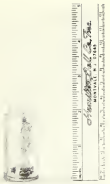


Figure B.62
Mucilage--
Cook's
Leather Cement

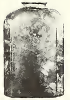


Figure B.63
Snuff--
Type 1

WINE BOTTLES

(See descriptions in Chapter 6)

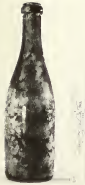


Figure B.64
Wine--
Champagne, or
Burgundy type

Figure B.65
Wine--
Bordeaux type

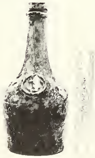


Figure B.66
Wine--
Benedictine type

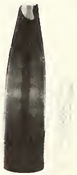


Figure B.67
Wine--
Rhine type

SODA BOTTLES

Embossed labels reproduced verbatim. "//" signifies separate line of text. "(X)" = number of specimens. "F" = front, "R" = reverse.

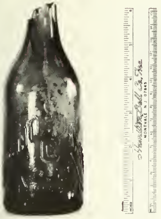


Figure B.68
Bay City, Type 1 (2)
F: "BAY CITY SODA WATER //CO.//S.F."
R: 2" star
Color: Cobalt blue

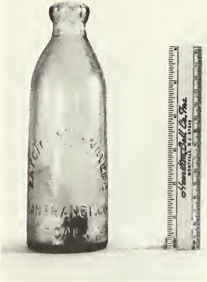


Figure B.69
Bay City, Type 2 (11)
F: "BAY CITY SODA WATER //CO.//SAN FRANCISCO// CAL."
R: Blank
Color: Aqua
Has Matthews' Grav. Stopper.

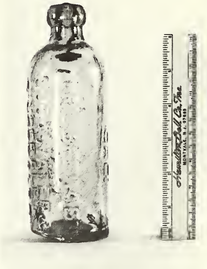


Figure B.70
Belfast (1)
F: "THE BELFAST//SODA WATER &//GINGER ALE Co.// SAN FRANCISCO//CAL."
R: Blank
Color: Aqua

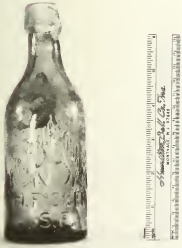


Figure B.71
California Soda Works (1)
F: "CALIFORNIA SODA WORKS //H. FICKEN//S.F."
R: U.S. eagle with snake in beak
Color: Aqua

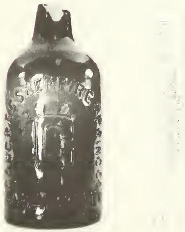


Figure B.72
Congress Spring (1)
F: "CONGRESS & EMPIRE SPRING CO//SARATOGA N Y" arranged in oblong surrounding large "C"
R: "CONGRESS//WATER"
Color: Emerald green

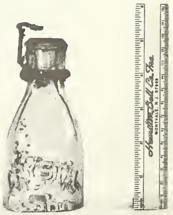


Figure B.73
Crystal, Type 1 (1)
F: "CRYSTAL//SODA//WATER Co."
R: "PATENTED//NOV. 12 - 1872//U.S. Pt"
Color: Aqua
Note: Has patented mouth.

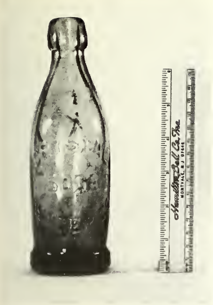


Figure B.74
Crystal, Type 2 (1)
F and R identical to Type 1.
Color: Aqua
Note: Has standard blob top, on same body as Type 1.

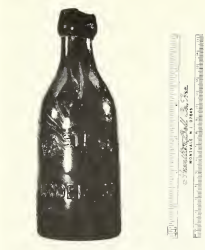


Figure B.75
Eastern Cider (2)
F: "EASTERN//CIDER//Co.
R: Blank
Color: Amber

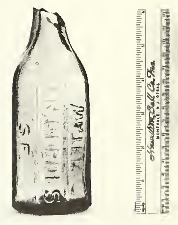


Figure B.76
J.N. Gerdes (8)
Octagonal bottle; embossing vertical.
"J.N. GERDES//S.F." on two sides; "MINERAL//WATER" on two sides opposite name.
Color: Aqua

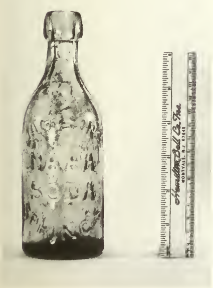


Figure B.77
Jackson's Napa Soda (3)
F: "JACKSON'S//NAPA//SODA//SPRINGS"
R: "NATURAL//MINERAL WATER"
Colors: Aqua, blue, green

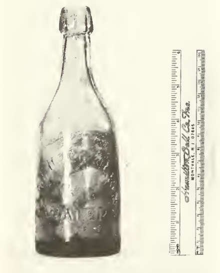


Figure B.78
Pacific Congress (4)
F: "PACIFIC CONGRESS (curved) //WATER"
R: Deer (2), blank (2)
Color: Aqua

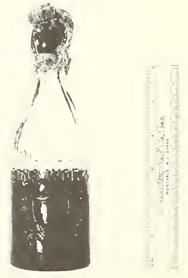


Figure B.79
Pioneer Soda Works (2)
F: "PIONEER//SODA WORKS" above 1-1/2" chevron, framed by "TRADE. . .MARK"
R: Blank
Color: Aqua

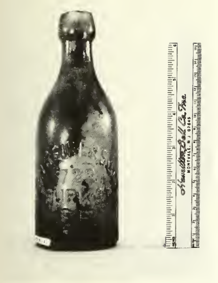


Figure B.80
C.A. Reiners & Co. (1)
F: "C.A. REINERS & Co (curved)//723//TURK ST//S.F."
R: "IMPROVED//TRADE MARK//MINERAL WATER" surrounds crescent moon and stars
Color: Aqua

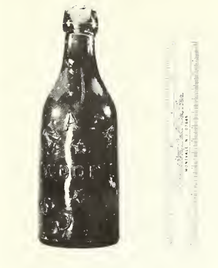


Figure B.81
Wood's Napa Soda (1)
F: "NAPA (curved)//WOOD'S// SODA (curved)", with two stars separating the words
R: "NATURAL//MINERAL WATER//TWF A.G.T." (TWF = Thomas W. Fenn(?), agent for Napa Soda, 1870-71)
Color: Cobalt blue

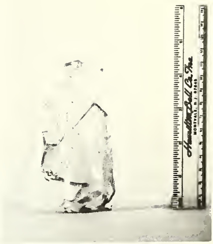


Figure B.82
Unidentified (1)
Two body fragments, bearing part of embossed label for Seattle firm. Lettering, in 2-1/4" circle: ". . .W BOTTLING// . . .TTLE, WASH". In center: "(W)ORKS".
Color: Clear

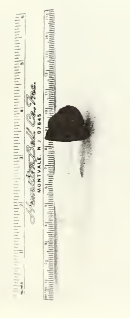


Figure B.83
Matthew Stopper (1)
Embossed lettering, 1/16" high, lengthwise, reads "PATENTED// AUG. 26, 1862//OCT. 11, 1864"
Color: Clear

APPENDIX C

CATALOG OF CHINESE CERAMIC WARE COLLECTED AT N-5

Appendix C, "Catalog of Chinese Ceramic Ware Collected at N-5," contains additional material useful for a greater understanding and appreciation of the nineteenth century Overseas Chinese ceramics from the N-5 site in San Francisco. Although the tables and photographs presented here have some general interest, the appendix is primiarily designed as a guide for the research scholar specializing in this area of Chinese ceramic analysis.

The appendix is divided into two main sections which are both keyed to the text of Chapter 9. Part I contains a set of 5 tables and 16 photographic reproductions of selected specimens in the archaeological collection. The tables are consecutively numbered from 9.05 to 9.09 following the sequence established in the text in order to facilitate referral back to material presented in Chapter 9. The photographs highlight aspects of certain artifacts, adding to the visual information about the ceramics. Where possible, the photographs are grouped with the table which details that category of ceramic ware.

Part II of this appendix catalogues and describes in individual detail the bulk of the Miscellaneous category of Chinese ceramic tablewares not included directly in the body of Chapter 9. Specific details regarding the contents of Parts I and II of this appendix precede each section.

PART I. TABLES 9.05 - 9.09 AND FIGURES C.01 - C.16

The 5 tables presented here dealing with the N-5 Chinese ceramics contain data of use to historical archaeologists and ceramic specialists. The tables included are:

Table 9.05	Type I--Utilitarian Brown Ware--Selected Specimens
Table 9.06	Type II Bl. Celedon Tableware--Selected Specimens
Table 9.07	Interpretation of Characters and Marks on Celedon Ware
Table 9.08	Enameled Flower Ware/Four Seasons Pattern Tableware--Selected Specimens
Table 9.09	Translation of Characters on Opium Pipe Bowls

Briefly, Table 9.05 gives detailed measurements of a selected number of Type I, or Utilitarian Brown Ware vessels in our collection. Examples of all shape types in this group are represented in tabular form. Photographic illustrations of some of the more important types of this utilitarian ware accompany the table (see Figures C.01, C.02, C.03, and C.04).

The next two tables, 9.06 and 9.07, focus on the numerous porcelain Celedon Tablewares recovered from the N-5 site. Table 9.06 presents the size dimensions for selected pieces of each type of Celedon Ware such as cups, bowls, dishes, plates, and spoons, while Table 9.07 offers a list of translations of the Chinese characters and manufacturers' marks found on the base of most all the specimens of this class in the collection. The significance of these marks is fully discussed in the section in Chapter 9 dealing with the Celedon Ware artifacts.

The last table, 9.09, presents complete data regarding all the Chinese characters and makers' marks that were impressed on the 6 opium pipe bowls recovered from the N-5 archaeological deposit. The series of close-up photographic illustrations of these marks are included for use in conjunction with Table 9.09 (see Figures C.09 through C.14, inclusive). The data contained in this table and in the photographs has use in the identification and comparative study of opium pipe bowls found in archaeological contexts elsewhere.

Finally, six other photographs have been included here in Part I of Appendix C. Figures C.05 and C.06 illustrate the Three Circles and Dragonfly and the Swirl or Double Happiness design motifs. These patterns, found chiefly on the porcellaneous stoneware bowls, were very popular on common nineteenth-century Chinese export ceramic ware. Bowls decorated in these styles were widely used by the Chinese in America during the last century and examples of these ceramics have been recovered from a number of sites in California and Western America. It is primarily because these particular patterned bowls were so much a part of early Chinese American everyday life that these additional figures have been included here. In contrast, the two illustrations of the Character with Figures Tea Pots are less common and unique to the N-5 collection; therefore, additional illustrative material is useful and justifiable (see Figures C.07 and C.08). A complete discussion of these two tea pots and the cultural messages painted on them in the form of Chinese characters and historic figures appears in Chapter 9. The last two photographs of the Decorative Temple Tiles and the Sand Pot Incense Container with Tripod Base help us visualize better these two important and relatively rare artifactural components of the Chinese ceramic collection (see Figures C.15 and C.16, respectively). All the tables and photographs included in this appendix complement the discussion of nineteenth-century Overseas Chinese ceramics found in Chapter 9, and the additional tabulated data and illustrative material herein will undoubtedly be useful for future research.

TABLE 9.05

TYPE I. UTILITARIAN BROWN WARE--SELECTED SPECIMENS

Vessel Type	Specimen Number	Height	Maximum Diameter	Neck/Rim Diameter	Foot Diameter	Volume or Thickness	Minimum Number of Vessels
A. BEVERAGE BOTTLES							13 Total
1. Traditional Shape	N5-1	16.3 cm.	12.45	5.8	8.35	29 ounces	
	N5-EE-176	17.4	12.8	5.65	8.85	32	(8)
	N5-U-63**	17.5	12.5	5.6	8.5	30	
2. Anglo Shape	N5-Z-290A,B	27	8.8	2.7	8.1	27	
	N5-N376**	27.1	8.8	2.5	8.2	28	
	N5-N-375	28.2	8.5	2.5	8	27	(5)
B. SPOUTED JARS							38 total
1. Small	N5-N-785**	8.3	7	4.15	6.7	6	(12)
	N5-N-404	8.3	7.5	4.35	6.65	6	
	N5-N-402	8.5	7.6	4.3	7	8	
	N5-N-406	8.45	7.9	4.3	6.8	8	
2. Medium	N5-N-400**	9.9*	11.6	?	10.1	23	(1)
3. Large	N5-Z-291	12.4	14.5	4.4	12.65	ca.41	(25)
	N5-N-399	12.35	14.4	4.55	12.55	43	
	N5-U-332	12.7*	15.25	?	12.9	52	
	N5-FF-217**	13.5	14.8	4.85	13.7	51	
C. STEEP-SHOULDERED JARS							9 total
1. Small: Rim Sherds	N5-L-254	?	?	ca.8 cm.	?	.6-.9	(4)
	N5-M-473	?	?	ca.8	?	.8-1.2	
	N5-N-166	?	?	ca.9	?	.4-.9	

*Incomplete, accurate measurement not possible.

**Specimen illustrated.

***Lids of Straight-Sided Jar type.

TABLE 9.05 (continued)

Vessel Type	Specimen Number	Height	Maximum Diameter	Neck/Rim Diameter	Foot Diameter	Volume or Thickness	Minimum Number of Vessels
C. STEEP-SHOULDERED JARS (cont'd)							
Base Sherds	N5-Z-73	?	?	?	ca.11	1-1.2	(3)
	N5-U-572	?	?	?	ca.12	.7-1.5	
	N5-Z-72	?	?	?	ca.12	.9-1.4	
2. Large: Rim Sherds	N5-FF-30**	?	22.5 cm.	ca.11	?	.5-1.1	(5)
	N5-FF-33	?	?	ca.14	.	.9-1.0	
Base Sherds	N5-U-574	?	?	?	ca.13	.7-.9	(6)
	N5-FF-35	?	?	?	ca.13	.6-1.2	
	N5-N-521**	?	?	?	ca.14	1.3-2.8	
D. SHOULDERED FOOD JARS							5 total
1. Extra Small	N5-N-408**	7.8	7.2	3.9-4	6.2	7 ounces	(1)
2. Medium	N5-U-82	12.5	14.8	9.6	12.9	46	(3)
	N5-U-83	12.6	15	10.1	12.7-12.8	42	
	N5-U-333**	12.8	14.9-15.1	13.2-13.3	9.8	48	
3. Extra Large	N5-M-650	17.5 cm.	17.7-17.9	8.9	11.5	70 ounces	(1)
E. STRAIGHT-SIDED JARS							6 total
1. Huge: Rim Sherds	N5-L-105	?	?	ca.26-29	?	.7-1.2	
	N5-U-570	?	?	ca.30	?	1.1-2.5	
Base Sherds	N5-FF-80	?	?	?	ca.33	.4-1.2 cm.	
	N5-U-573	?	?	?	ca.36	.6-1.3	
F. LIDS							9 total
1. Flared Straight-Sided	N5-U-172	1.35	4.8	4.6(top)	4.8	.3	(1)
2. Straight-Sided with Rim***	N5-U-569	5.3-5.4	35	x	x	.7-1.5	(3)
	N5-L-263	5	36	x	x	.7-1.1	

TABLE 9.05 (continued)

Vessel Type	Specimen Number	Height	Maximum Diameter	Neck/Rim Diameter	Foot Diameter	Volume or Thickness	Minimum Number of Vessels
F. LIDS (cont'd)							
3. Flanged Cap	N5-U-583	2.1-2.2	9.8	9.6	x	.3-.7	(5)
	N5-Y-50	2.3-2.4	9.8-10	9.6-9.9	x	.5-.9	
	N5-M-333	2.1	10.1	10	x	.8-.85	
G. THIN BROWN JARS							12 total
	N5-N-372	8.8	6.6	3.5-3.7	3.4-3.5	5.5	
	N5-N-368	9.5	7.3	3.4-3.6	3.9	7	

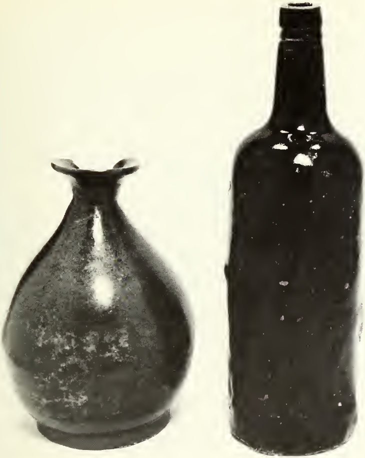
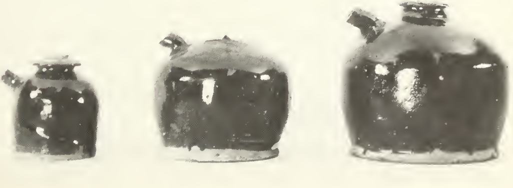


Figure C.01: Traditional and Anglo Shape Beverage Bottles. . . .On the left is the Traditional Shape Chinese alcoholic beverage bottle often containing potent Chinese whiskey. On the right is the unique Anglo Shape Beverage Bottle, also a utilitarian Brown Ware vessel, but one with a peculiarly European-influenced form. (Ed Torres)

Figure C.02: Three Sizes of Spouted Jars. . . .By far the largest number of Utilitarian Brown Ware containers in the N-5 sample were these distinctly domed shaped spouted jars. (Ed Torres)



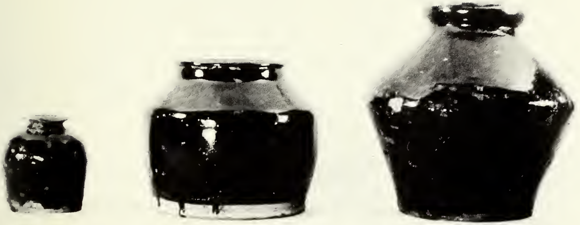


Figure C.03: A Range of Shouldered Food Jars. . . These Utilitarian Brown Ware vessels, made in a wide range of sizes, served as storage containers. (Ed Torres)

Figure C.04: Unique Thin Brown Jars. . . These thin-walled but surprisingly durable small eggshaped jars measure about 3½ inches in height. They may have contained some potent alcoholic beverage or some exotic condiment. (Ed Torres)

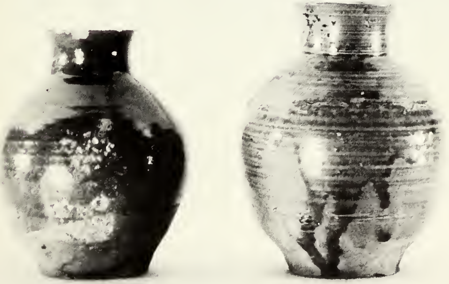


TABLE 9.06

TYPE II B1. CELEDON TABLEWARE--SELECTED SPECIMENS

Shape Type	Specimen Number	Height	Maximum Diameter	Foot Diameter	Minimum Number of Vessels
WINE CUPS	N5-N-480	2.3 cm.	4.4-4.5	1.7+	16
	N5-P-198	2.3	4.6+	1.9	
	N5-M-165	2.6	5.1	2.1	
TEA CUPS					67
Small	N5-L-57	3.1	6.7	2.4	(1)
Large	N5-N-474	3.7	7.5+	2.6	(66)
	N5-M-358	4.4	ca.8.5	2.5	
	N5-U-111	4.4	ca.7.7	2.8	
RICE BOWLS					42
Small	N5-V-150	5.5	ca.12	4.2	(2)
	N5-U-601	5.8	ca.12-13	4.7	
Large	N5-N-796	6.0	14	5.6	(40)
(or small serving)	N5-M-516	6.9	ca.14-15	5.5	
SHALLOW DISHES					13
Small	N5-U-117	2.6	ca.8	4	(9)
	N5-M-520	2.85	8.5	4.5	
	N5-M-521	2.9	8.5	ca.3.7	
Medium	N5-W-11	(2.4)*	(14.2)	8.4	(1)
Large	N5-U-437	2.7 cm.	ca.18	10.5	(3)
	N5-M-199	3.3	19	11.1	

*() indicates projected measurement.

TABLE 9.06 (continued)

Shape Type	Specimen Number	Height	Maximum Diameter	Foot Diameter	Minimum Number of Vessels
PLATES					3
Medium	N5-N-551	2.1	14.7	8.2	(1)
Large	N5-N-808	2.9	ca.25	ca.14	(2)
SPOONS					
(Bowl Portion)	N5-Z-369	1.5	5.1 (length)	5.2 (width)	7
	N5-V-98	1.7	5.5	5.3	

TABLE 9.07

INTERPRETATION OF CHARACTERS AND MARKS ON CELEDON WARE*

Specimen Number		Interpretation	Reference
Wine Cups			
N5-N-474		Single character **ssu**, or four	Fenn 1966:481
N5-N-482		Single character **ssu**, or four	Fenn 1966:481
N5-M-165		Single character, possibly **chi**, or seven, backwards in execution; could simply be a mark	Fenn 1966:37
N5-M-511	N5-N-723	Single character **jih**, or sun	Fenn 1966:229
N5-M-541	N5-0-36		
N5-N-481	N5-P-198		
N5-N-483	N5-U-597		
N5-N-509	N5-U-599		
N5-N-479		Single, illegible rectangular character	
N5-N-480		Single, illegible circular character	
Tea Cups			
N5-V(Y)-68		Single character, possibly an **i**, or one	Fenn 1966:216
N5-U-417 (w/417a)		Single character **erh**, or two (abbreviated)	Fenn 1966:125
N5-M-169a	N5-U-420a	Single character **ssu**, or four	Fenn 1966:481
N5-P-209	N5-U-600c		
N5-U-389	N5-U-682		
N5-N-476		Single character with extra line on **jih**, or sun, thus interpreted as **ssu**, or four	Fenn 1966:229 Fenn 1966:481
N5-U-219		Single character **ssu**, or four, in seal script	Fenn 1966:481
N5-U-600a		Single character **wu**, or five (abbreviated), or possibly "**sau**", or three	Fenn 1966:608 Fenn 1966:428
N5-M-518		Single character, irregular **wu**, or five	Fenn 1966:608
N5-L-57	N5-V-23	Single character **jih**, or sun	Fenn 1966:229
N5-M-169b	N5-V-24		
N5-M-169c	N5-V-151		
N5-M-196	N5-V-477		
N5-M-688	N5-Z-106		
N5-N-197	N5-Z-109		
N5-N-474	N5-L-267		
N5-N-475	N5-U-420		
N5-N-508	N5-U-683		
N5-N-518	N5-V-81		
N5-N-797	N5-Y-11		
N5-P-210	N5-L-268		
N5-U-395	N5-N-798		
N5-U-600b	N5-EE-198		

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*Julia M. Andrews and Holly Holtz interpreted these handpainted cobalt marks.

TABLE 9.07 (continued)

Specimen Number		Interpretation	Reference
Tea Cups (cont'd)			
N5-L-266 N5-M-169 N5-M-169d N5-M-358 N5-M-360	N5-M-365 N5-M-517 N5-U-600 N5-Z-107	Single character, intermediate between **ssu,** or four, and character **jih,** or sun	Fenn 1966:481 Fenn 1966:229
Rice Bowls			
N5-L-273	N5-M-188a	Reign mark, T'ung Chih (1862-1874)	Honey 1927:104
N5-M-189		Character arrangement: $\overset{\overline{531}}{\underline{642}}$.	
N5-0-38		2 = **chin,** or gold; 3 = **ch'e,** or car, cart, carriage. Possibly a hallmark.	Fenn 1966:74 Fenn 1966:23
N5-M-687		Character arrangement: $\overline{\underline{321}}$.	Fenn 1966:82
N5-Z-356		Characters 1 and 3 illegible. Second character seems to be **ch'ing,** or blue, green, young, etc. Alternatively, 3 and 2 together may be **Ch'ing,** referring to dynasty.	Fenn 1966:XXVI
N5-N-514		Character arrangement: $\overset{\overline{531}}{\underline{642}}$	
N5-Z-110		3 = **Ta,** or great.	Fenn 1966:485
		4 = **Ch'ing,** or blue, young, etc., or possibly a version of standard reign title "Great Ch'ing Dynasty". 6 and 4 together (awkward caligraphically) are equivalent to Ch'ing, as in the dynasty. If "Great Blue" is correct, 1, 2, 5, and 6, which are illegible, may be imitations of seal script.	Fenn 1966:82
N5-U-126		Character arrangement: $\overset{\overline{531}}{\underline{\ 42}}$.	
N5-U-393		4 = probable nonsense character; 3 = **fu,** or good fortune or happiness; 1, 2, 5 = indecipherable vertical and horizontal lines.	Fenn 1966:140
N5-U-222		Character arrangement: $\overset{\overline{531}}{\underline{642}}$.	
N5-U-419		3 = **Tung;** 4 = **Ch'un,** or spring (on one piece)	Fenn 1966:107

TABLE 9.07 (continued)

Specimen Number		Interpretation	Reference
Rice Bowls (con't)			
N5-U-418		Character arrangement: $5^{\overline{2}}_{3}$ 1. 2 to 4 $\underline{4}$ may be dates or numbers in standard script. 2 = **san**, or three; 3 = **ping**, or cylindrical numerical symbol used in dates; 4 = untranslatable character; 1 and 5 may be pseudo-seal script or untranslatable.	Fenn 1966:428 Fenn 1966:403
N5-U-601		Character arrangement: $\overline{1}$ $\underline{2}$. 1 = untranslated; 2 = **T'ai**, or great, too.	Fenn 1966:491
N5-N-516	N5-U-125	Uninterpreted.	
N5-N-194 N5-N-195 N5-N-504 N5-N-796 N5-M-170	N5-M-188 N5-V-150 N5-EE-60 N5-EE-143	Undecipherable rectangular seals.	
N5-N-515 N5-U-127 N5-V-80		Rectangular mark with diaper pattern. Center character is **pen**, or root or source.	Fenn 1966:395
N5-M-516 N5-M-537	N5-Z-357	Rectangular mark with diaper pattern. Center character is **jih**, or sun.	Fenn 1966:229
N5-N-799		Rectangular mark with diaper pattern. Possibly **jih**, or sun.	Fenn 1966:229
N5-M-536 N5-X-22		Rectangular mark with diaper pattern. Center character probably **hsi**, or a long time ago.	Fenn 1966:161
N5-W-10 N5-Y-69		Rectangular mark with a diaper pattern. No interpretation possible.	
Shallow Dishes			
N5-W-11		Reign mark, possibly T'ung-Chih (1862-1874). (See bowls N5-U-222, N5-U-419.)	Honey 1927:104
N5-N-505		Single character, possibly abbreviation for **kuo**, or country, nation.	Fenn 1966:280
N5-0-41		Single character, **jih**, or sun.	Fenn 1966:24

TABLE 9.07 (continued)

Specimen Number		Interpretation	Reference
Shallow Dishes (con't)			
N5-N-478 N5-U-117		Single character, possibly **jih**, or sun.	Fenn 1966:24
N5-M-199 N5-M-362 N5-M-520 N5-M-521	N5-M-545 N5-U-437 N5-U-596 N5-V-25	Uninterpretable marks.	
Plates			
N5-N-551 N5-N-808 N5-Z-160		Undecipherable rectangular seals.	
Spoons			
N5-L-299		Single character, possibly **shih**, or family or clan, or even **fan**, or ordinary.	Fenn 1966:455 Fenn 1966:128
N5-M-562 N5-U-690		Single character **san**, or three	Fenn 1966:428
N5-V-98		Single character **shan**, or mountain	Fenn 1966:434
N5-Z-369		Single character, **shih**, or ten, or **ch'i**, or seven.	Fenn 1966:450
N5-Z-370		Single character, probably cursive script or a cipher.	Fenn 1966:37

TABLE 9.08

TYPE II B2. ENAMELED FLOWER WARE/FOUR SEASONS PATTERN TABLEWARE--SELECTED SPECIMENS

Shape Type	Specimen Number	Height	Maximum Diameter	Foot Diameter	Minimum Number of Vessels
Wine Cups	N5-M-376	2.2 cm.	4	2	21
	N5-M-522	2.4	4	2.1	
	N5-M-523	2.55	5.5	1.7+	
	N5-Z-359	2.7+	ca.5	1.9	
Tea Cups (octagonal)	N5-M-512	3.8	6	2.6	9
	N5-M-167	4.0+	6.1	2.45	
Rice Bowls					44*
Small	N5-U-119	ca.3.9	ca.11	ca.5	(11)
	N5-U-397	4.5	11	5.0	
	N5-M-272	4.7	13	5.5	
High Sided	N5-V-145	5.8	10	4.0	(4)
	N5-5-526	5.9	10	4.3	
Serving Bowls					
Medium	N5-V-152	ca.5.4	16	ca.6-7	(3)
	N5-0-39	ca.5.5	ca.16-17	ca.8	
Large	N5-P-205	6.2	ca.18.5	7.3	(2)
	N5-N-132	ca.7.2	ca.21	ca.8.5	

* Of the 44 bowls represented, only 20 were complete enough to permit comparative measurements.
** Indicates projected measurement.

TABLE 9.08 (continued)

Shape Type	Specimen Number	Height	Maximum Diameter	Foot Diameter	Minimum Number of Vessels
Shallow Dishes					38
Small	N5-N-190	1.9	7.8	4.5	(15)
	N5-N-724	2.1	7.9	4.1	
	N5-P-219	2.5	8.3	4.8	
Medium	N5-U-224	1.75	ca.9-10	6.1	(4)
	N5-P-218	1.8	ca.9.10	5.4	
	N5-N-729	2.1	10	5.7	
Medium Large	N5-BB-19	1.9	12.9	8.1	(16)
	N5-P-216	2.1	12.6	7.6	
	N5-N-484	2.1	13.3	8.2	
Large	N5-U-439	2.8	(17.2)**	10.2	(3)
	N5-N-809	3.5	(22.6)	ca.14-15	
	N5-M-732	(3.8)	(19.4)	14	
Spoons					26
(Bowl portion)	N5-N-572	1.3	5.0 (length)	4.7 (width)	
	N5-N-812	1.6	5.6	4.7	
	N5-N-217	1.5	5.3	4.9	
	N5-N-218	1.7	5.1	4.7	
(Handle portion)	N5-N-219	4.5	6.8 (length)	.9-1.9 (width)	(2)
	N5-U-62b	5.9	6.8	1.-2.1	

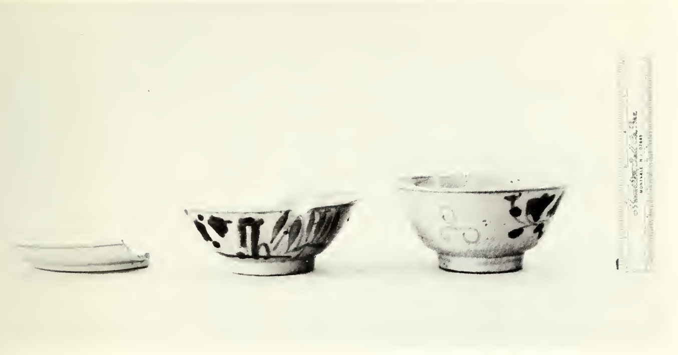
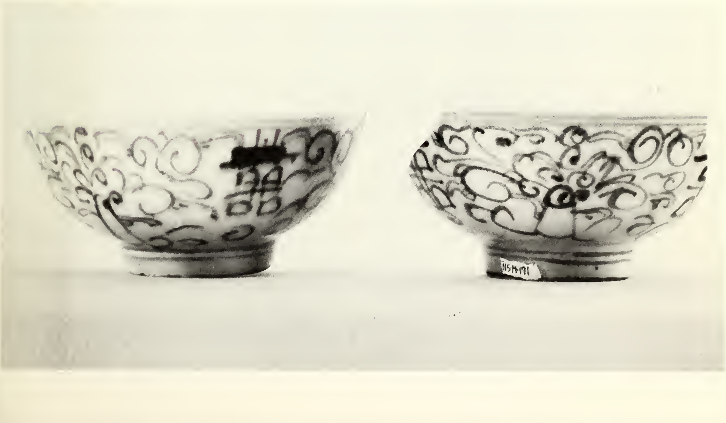
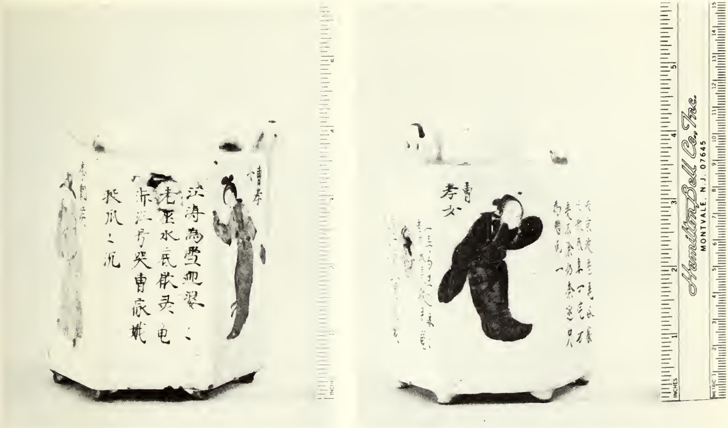


Figure C.05: Three Circles and Dragonfly Bowls and Dish. . .A common design pattern on imported Chinese stoneware bowls of the nineteenth century, it sometimes occurs on dishes as well. The three circles are visible on the bowl to the right. (Ed Torres)

Figure C.06: Two Rice Bowls with Swirl or Double Happiness Design. . . Equally as widely used as the Three Circles and Dragonfly Bowls were these Double Happiness Bowls. Both types conveyed rich cultural meaning to the sojourners using them. (Ed Torres)





Figures C.07 and C.08: Hand-painted Six-Sided Character with Figures Tea Pots. . . These unique tea pots graced the tables in the Chinese quarter of San Francisco a hundred years ago. On each tea pot, three different legendary or historical Chinese cultural figures are painted with an accompanying story on the next panel (see Chapter 9). (Ed Torres)

TABLE 9.09

TRANSLATION OF CHARACTERS ON OPIUM PIPE BOWLS

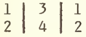
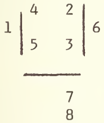
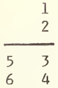
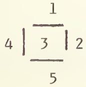
Specimen Number		Interpretation	Reference
N5-M-43	2 1	1 = **lo, lu,** or happy, happenings.	Fenn 1966:320
		2 = **yen,** or smoke. Full incription in translated as "Happy Smoking" or "Smoking Happiness".	
N5-N-215		1 = **mu,** or tree.	Fenn 1966:350
		2 = **tung,** or east.	Fenn 1966:578
		1 and 2 = East of the tree, probably a placename.	
		3 = **kao,** or high.	Fenn 1966:243
		4 = **chi,** or record, possibly translated as "high-class product".	Fenn 1966:35
N5-N-374		1 = probably shop name.	
		6 = **hang,** or shop.	Fenn 1966:149
		1 and 6 probably form shop name.	
		2 = **shui,** or water.	Fenn 1966:467
		3 = **tung,** or east.	Fenn 1966:578
		4 = possibly **hui,** or to return.	Fenn 1966:208
		5 = **shan,** or mountain.	Fenn 1966:434
		2 to 5 read "Hui mountain East of the River" possibly shop location.	
		7 = **Chao,** a surname.	
		8 = **tsao,** or made (this).	Fenn 1966:546
		Same shop as N5-EE-129.	
N5-EE-129		1 = **Chao,** a surname.	
		2 = **tsao,** or made (this).	Fenn 1966:546
		5 = **Shui,** or water.	Fenn 1966:467
		6 = missing	
		7 and 8 probably refer to "Hui, Mountain east of the River."	
N5-N-377		1 = **Cheng,** a surname, bounded on either side by circular marks.	
		2 = **Shui,** or water.	Fenn 1966:467
		3 = **Pien,** or next to.	Fenn 1966:408
		4 = **Meng,** or sprout or bud.	Fenn 1966:337
		5 = illegible, probably **hsi,** or double happiness.	Fenn 1966:161
		Same shop as N5-X-10.	

TABLE 9.09 (continued)

Specimen Number	Interpretation	Reference
N5-X-10	6 5 | 4 | 3 2 | 1	
	1 = **Cheng**, a surname.	
	2 = **Shui**, or water.	Fenn 1966:467
	3 = **Pien**, next to.	Fenn 1966:408
	2 and 3 - by the water.	
	4 = **Meng**, sprout or bud.	Fenn 1966:337
	5 and 6 - double **hsi**, or double happiness.	Fenn 1966:161
	2 to 4 probably a placename, bounded by circular marks.	
	Same shop as N5-N-377.	

Figures C.09 through C.14: Opium Pipe Bowls. . .Details of makers' marks impressed on the bowls. (Ed Torres)

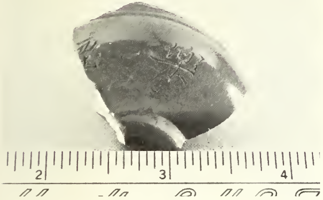


Figure C.09

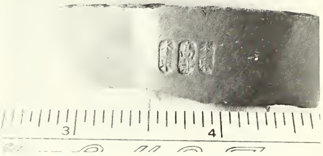


Figure C.10

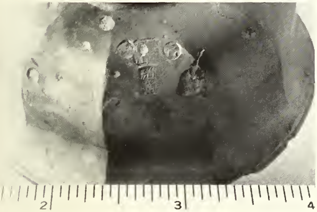


Figure C.11

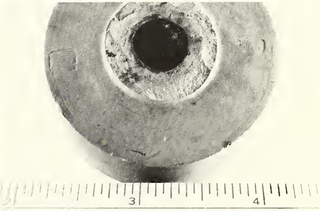


Figure C.12

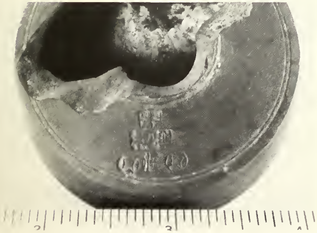


Figure C.13

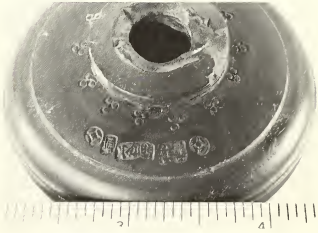


Figure C.14

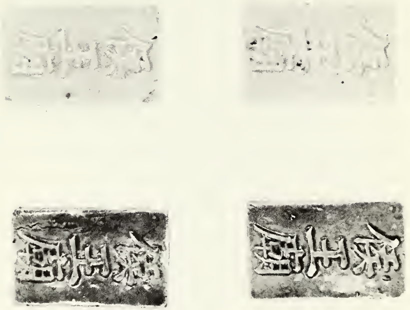


Figure C.15: Decorative Temple Tiles. . . Four samples from the cache of 76 small decorative tiles are shown here. About 1/3 are glazed yellow and the rest are glazed green. All measure 1" x $1\frac{1}{2}$" x $\frac{1}{4}$". (Michael Love)

Figure C.16: Sand Pot Incense Container with Tripod Base. . . This ceramic artifact once was part of the ceremonial paraphernalia in Chinese ritual practices. The upper portion contained sand into which incense sticks were stuck. The pot rested on three small rounded feet that conveniently fitted into depressions on the lower ceramic base. (Ed Torres)

C. Miscellaneous Tableware (refer to Chapter 9)

Catalogued and described below are Miscellaneous Tableware tea cups, rice bowls, tea pot lids, unique vessel shapes, and miscellaneous sherds, as well as individual bowl covers from N-5 that were not fully discussed in Chapter 9.

Because individual specimens of the Miscellaneous Tableware are so dissimilar, each will be described briefly by accession number, overall shape (if a shape catagory has not already been specified), condition, style, and seal or pottery mark. Size is given first in terms of height, followed by rim and foot diameters or length and width dimensions. A careful review of this catalog list of disparate miscellaneous types suggests the exceptionally wide diversity of the ceramic items in the N-5 collection. It is clear that this diversity reflects the central role San Francisco has played in Chinese-American life.

Miscellaneous Tea Cups:

Among the octagonal Tea Cups, the distinctive "Bamboo Clump" pattern, which is interspaced with character panels, is considered as a separate unit based on five sherds. Within the entire N-5 sample, the pattern appears only on Tea Cups including two bases (N5-M-194 and N5-N-734), two rim sherds (N5-M-181 and N5-M-182), and a single body sherd (N5-M-186). None of the sherds are broken along contiguous fractures which would allow a reconstruction of the cup type.

The porcelain tea cup body is painted with two large clumps of bamboo placed equidistantly from one another on the exterior of the cup. The most complete example (N5-M-182) has two tiers of at least four concentrations of leaves which extend over three of the panels. The pattern is applied with green and brown overglaze enamel, as well as with outlining in brown-black overglaze paint. This foliage is interspersed between panels of characters painted with black overglaze to complete the entire pattern.

Given the incomplete nature of all the specimens in the sample, the projected height is about 5.8 to 6 cm., while the diameter varies from 5.4 to 6.8 cm., with the base or foot ranging from 3.4 to 3.6 cm. in diameter.

The translation of the few characters on the incomplete "Bamboo Clump" pattern tea cups suggest that each panel between the foliage was filled in a manner of a five-character single-line poem. For example, N5-M-180A includes the character **shang**, or "above" and **wen**, or "to hear" or "to smell" (Fenn 1966: 438, 601). The apparent meaning of this incomplete fragment is thus, "above (blank) hear. . ". The second cup fragment, N5-M-108B, shows what is probably the first line of another five-character single-line poem which can be translated as "Bright moon, slight wind". (The first character is **ming**, or "bright"; the second, **yüeh**, or "moon"; and the fourth, **feng**, or "wind." The third and fifth characters are now missing; see Fenn 1966: 344, 596, and 136.) The last sherd of the style, N5-N-734, has only two characters which again are part of a five-character poem. The first can be interpreted as **wei**, or "little" or "minute" (Fenn 1966: 596), while the second is an untranslatable abbreviation.

Another pattern found on octagonal Tea Cup fragments is designated "Varied Plants". Represented by one-half of an octagonal cup (N5-M-511) and a rim sherd (N5-Y-75), it is reminiscent of the octagonal cup associated with the "Four Seasons" pattern. The two intact panels of the "Varied Plants" pattern cup measures 4.2 cm. in height with at least a 5.7 cm. maximum diameter along with a 2.5 cm. foot diameter.

Neither the "Bamboo Clump" nor the "Varied Plants" patterns are illustrated as part of material recovered from any archaeological site in the western United States. Although there are some similarities with the Enameled Flowered Ware, these two stylistic patterns are unique and distinct.

The following Miscellaneous Tea Cups were also found at N-5.

N5-M-513: One half of a cup; porcelain; handpainted cobalt underglaze; script poem composed of five characters placed in four quadrants along with a single encircling line just under the rim and another two placed just under the sharp base angle; and incomplete pictorial mark; 4.3 cm. h., 6.4 cm. rim dia., 2.9 cm. foot dia.

N5-M-535: The foot and one-eighth rim of an octagonal cup; porcelain; a coral-orange overglaze enamel with four plants in resist decoration with gold trim on the rim; a faded reign mark on the base of the T'ung-Chih period (1862-1875) (Fenn 1966: XXVI; Stephen L. Little and Holly Holtz, personal communication); 5.2 cm. h., about 6.8 cm. w.; 3.5 cm. foot dia.

N5-M-675: About one-fourth of a cup missing handle (two nubs present); porcelain; curvilinear ground imitative of cloisonné tendrils in black and gold overglaze enamels; obscured depictive medallion with small red insect and a single encircling line in red just above the foot; inner rim border 1.1 cm. in width, similar in style to exterior ground; probably an export tea cup of the 1860s from Canton (Stephen L. Little, personal communication); 4.8 cm. h., about 5 to 6 cm. foot diameter.

N5-N-485: Three-quarters of rim missing; porcelain; handpainted plant in a rectangular container with the character **t'ien**, sky or heaven (Fenn 1966: 523) located on the opposite side of the cup (similar in style to bowl N5-Z-115); painting in brown overglaze enamel along with a now-tarnished black; a rectangular seal mark in red overglaze paint of which the second character may be **yung**, or "use" (Fenn 1966: 642; Holly Holtz, personal communication); 5.1 cm. h., 7 cm. rim dia., 3.5 cm. foot dia.

N5-N-486: One-fifth of rim missing; porcelain; design of two double medallions and one single medallion or circle in overglaze paint with generally indecipherable fillers, placed equidistant from one another; one circle of the linked medallions is obviously a "T'ai Chi" with the division of the two parts formed by a curved line into **yin** and **yang** (Williams 1931: 355); overglaze enamels in green, rose, and shades of black (original colors unknown); possibly Japanese in style (Stephen L. Little and Holly Holtz, personal communication); 3.6 cm. h., 6.2 cm. rim dia., 2.3 cm. foot dia.

N5-N-493: Entire cup; porcelaneous stoneware; fuzzy abstract design handpainted in cobalt blue, perhaps tadpoles and waves or ripples; interior well has an encircling line just below the rim and another two lines midway down the side wall with a **ch'i** or seven painted in the well bottom (Fenn 1966: 37; Stephen L. Little and Holly Holtz, personal communication); glaze has greenish cast and the foot appears to be more inset than on most cups; 3 cm. h., 6.5 cm. rim dia., 2.8 cm. foot dia.

N5-N-801: One-half of a cup; porcelain; handpainted water scene with a swimming duck executed in cobalt underglaze; common style from the Late Ming period export ware to southeast Asia, Philippines, and Europe (Holly Holtz, personal communication); 4 cm. h., 5.9 cm. rim dia., 3 cm. foot dia.

N5-U-400: About one-half of a cup; porcelain; transfer pattern in a light cobalt blue with elaborate flowers with a streamlike divider placed vertically; wide curvilinear pattern executed just under the rim with three encircling lines at the base curve and another single line within the foot interior; slight greenish cast to interior glaze; pattern found in the Santa Barbara collection dating to turn of century (Paul C. Chace, personal communication); 3.9 cm. h., 8cm. rim dia., 4 cm. foot dia.

Miscellaneous Rice Bowls:

All 11 rice bowls with unique patterns have large sections missing which impairs description of the designs and patterns.

N5-N-537: Possible "Crab" pattern executed with outlining in brown-black and green overglaze enamels; faded rectangular seal mark painted with a red overglaze enamel may contain the character **hsing**, or "fragment" (Fenn 1966; Julia M. Andrews and Holly Holtz, personal communication); possible corresponding cover: N5-U-220; 4.2 cm. h., 4.3 cm. foot dia.

N5-N-538: "Crab" pattern painted with brown-black, light and dark green overglaze enamels; faded, indecipherable rectangular seal mark in red overglaze enamel; corresponding cover: N5-U-220 (see bowl N5-0-311 and N5-P-204); 3.5 cm. h., 4.2 cm. foot dia.

N5-N-549a-1: "Gold Plants" pattern painted with gold overglaze at the rim and on the body over a dull coral-orange overglaze enamel; missing foot; glaze and painting style suggest Japanese origin (Holly Holtz, personal communication); 5.6 cm. h., 10 cm. rim dia.

N5-N-733: "Goldfish" (or Carp) pattern executed with orange overglaze paint, in turn painted with gold overglaze paint, in addition to green and brown-black overglaze enamels; faded, indecipherable, rectangular seal mark in red overglaze paint; 3.6 cm. h., 4.7 cm. foot dia.

N5-0-31: "Crab" pattern on a sherd which extends from the rim to the body curve; decorated with outlines in brown-black overglaze paint over which brown, light and dark green overglaze enamels applied; corresponding cover: N5-U-220 (see bowl N5-N-538 and N5-P-204); 5.8 cm. h., 6.7 cm. width.

N5-P-204 with N5-P-208 and N5-P-251: "Crab" pattern executed with outlining in brown-black overglaze paint in addition to overglaze enamels in dark green and black; faded, indecipherable rectangular seal mark in red overglaze enamel; corresponding cover: N5-U-220 (see bowl N5-N-538 and N5-0-31); 3 cm. h., 4.2 cm. foot dia.

N5-W-14: "Four Gentlemen" executed in resist with an overall coral-red overglaze enamel with a clear glazed interior; faded, indecipherable rectangular seal mark in red overglaze enamel; corresponding cover: N5-W-13; 3.6 cm. h., 4 cm. foot dia.

N5-Y-72: "Bamboo and Characters" pattern produced with an outlining of brown-black overglaze paint over which a light and dark green overglaze enamel applied; extremely faded rectangular seal in red overglaze enamel which is composed of vertical lines (similar to the High-Sided Bowls of the Four Seasons Pattern); possible corresponding cover: N5-M-174; 4.8 cm. h., 4.2 cm. foot dia.

N5-Y-77: "Floral Boxes" pattern executed in cobalt blue underglaze with distinct greenish cast to the glaze; no mark on the base; 4.5 cm. h., 9 cm. rim dia., 3 cm. foot dia.

N5-Z-115: "Long Branch in Planter" pattern with outlines painted in brown-black overglaze paint, along with overglaze enamels of light and dark green; possibly a fragment of late "Four Seasons" pattern (Paul Chace, personal communication).

N5-EE-202: "Plants and Characters" pattern produced with an overall coral red overglaze enamel and resist technique; clear glazed interior; faded, indecipherable rectangular mark in red overglaze paint. Semi-cursive script characters, probably a poetry couplet. If characters correspond to the cover, the poems have seven characters per line. Translation of the 4 side appears to be
5 2 1
3

(1) **hui**, "kindness" or "benefit"; (2) **feng** probably an abbreviation; (3) **ho**, "harmony"; (4) and (5) cannot be deciphered. The opposite side with the remaining characters arranged 6 4 3 1 may be in-
5 2

terpreted as: (1) **pu**, an interrogative, combined with (2) **chih**, "I wonder", "don't know" (often employed as a rhetorical question); (3) **shih**, "room", "hall"; (4) combined with (5) **shih yu**, sometimes literally, "the times have"; (6) incomplete (Fenn 1966: 210, 154, 421, 65, 455, 450, 638; Julia M. Andrews, personal communication); corresponding cover: N5-Y-708; 4.2 cm. h., 4.3 cm. foot dia.

Miscellaneous Unique Vessel Shapes:

The N-5 collection contains a number of unique Tableware vessel shapes, almost all of which are decorated with patterns or motifs that are unprecedented in this collection or in any other. Since San Francisco was the center of the nineteenth century Overseas Chinese world in America, it is not surprising that such a wide variety of dfferent ceramic items appeared in the N-5 sample. Furthermore, the relatively large and established Chinese mercantile group procured many different types of foodstuffs as well as all sorts of supplies needed by the Chinese community. They, of course, also imported and purchased a greater variety of more costly ceramic Tableware for themselves as well. Thus, the likelihood of encountering more varied and unique Chinese ceramic items in a San Francisco refuse heap is understandably greater than in comparable sites located in peripheral towns and workcamps. With this in mind, let us examine all the different Unique Vessel Shapes present in the N-5 collection:

N5-LP-16: A intermediate size between a sweet or cold dish or serving platter; plain white scalloped shape which may have been overglazed; reminiscent of a stylized cloud in overall shape; 1.2 cm. h., 20 cm. 1., 14 cm. w.

N5-M-50: Shallow dish with subtle scalloping of the rim; cobalt blue underglaze painting which divides the design areas with an encircling line at the rim, four equidistantly-placed double vertical lines and linked ovals in the center of each quadrant, and three encircling lines to form a band at the base angle; an overglaze enamel of orange-brown and copper lustre, as well as black (original color unknown); chrysanthemum center with an "X" and "O" base band and quadrants with a "curl" ground (Barber 1914:52, no. 8); a possible floral design in the linked oval center; possibly an export to Japan (Holly, personal communication); 3.1 cm. h., 15 cm. dia.

N5-M-690: Probable sauce dish; round with slightly splayed shape to foot; asymmetrical design in overglaze enamels on the interior of a bird and floral pattern (now brown and black, original coloration unknown); dashes of gold overglaze arranged in clusters of four to six in the "sky"; foot ring exterior has a meander with a rectangular mark in cobalt underglaze painted on the base; possibly Japanese; 2.4 cm. h., 6 cm. rim dia., 2.2 cm. foot dia.

N5-P-22a: Probable sauce dish (Holly Holtz, personal communication); definite inward slant to foot; shallow round shape painted with a now fading asymmetrical floral design painted in orange, green, and possibly yellow with gold overglaze enamels; possibly Japanese; 1.4 cm. h., 7.5 cm. rim dia., 4.5 cm. foot dia.

N5-U-438: Probable serving dish fragment of the type used for nuts or candies (Holly Holtz, personal communication); scalloped shape; cobalt blue underglaze with linked circles on the interior of the incurving rim; bottom interior painted with a stylized pine tree while the exterior rim has a garden rake-like shape, a stick figure, as well as other shapes of indeterminate shape; 2.8 cm. h., 20 cm. l., 14 cm. w. (projected measurements).

N5-V-65a, b: Probable jar or box for fighting crickets or a table "lantern" (Chaffers 1946: 337); small fragments of six-sided vessel; dark blue cobalt underglaze with a vaguely floral motif on the narrow shoulder of the top; pseudo or "debased" key fret design band placed under the rim (Holly Holtz, personal communication); height probably greater than width; about 9.8 cm. w, 5.5 cm. rim dia.

N5-X-21: Possible serving dish fragment of multi-curved type with inset unusually shallow foot (Holly Holtz, personal communication); cobalt underglaze painting in an interlaced willow basket edging with a center interior which may be "Hundred Flowers Design" (see also jar sherd N5-P-247); feathered shape on the exterior of the bulbous curve; 2 cm. h., 10 cm. rim dia. (if round), 5 cm. foot dia.

N5-EE-65 with -92 and -93: High-footed serving dish with scalloped edges; painted overglaze enamels of centrally placed male figure of Fu Sheng, a Han dynasty scholar, facing characters painted in black overglaze. Fu Sheng is reputed to have preserved a section of the Canon of History in 213 B.C. by stuffing his copy in the wall of his house when the first Emperor of the Ch'ing Dynasty ordered the burning of all books on history and literature. The inscription discusses this event and notes tha Fu Sheng was over 90 years old as the time (Julia F. Andrews, personal communication; Giles 1898: 239). The dish also has plants resembling the "Four Seasons" pattern, along with bamboo painted along the rim which is denoted by a double line. Bats and peaches are interspaced on the exterior rim, while the foot has a green landscape which is interrupted by brown lump-like rocks with a thick red line located at the base. The peaches symbolize immortality (Chaffers 1946: 340), while five bats symbolize the five happinesses (Chaffers 1946: 341). The unglazed interior foot still has sand adhering. Furthermore, the dish displays the collection's only example of a drilled character, placed to the left of the central character which probably represents the owner's name. 5.2 cm. h., about 19.5 cm. l., about 17 cm. w.

Miscellaneous Sherds:

The N-5 Chinese ceramic collection contains 19 Miscellaneous Sherds that have been catalogued. All of these sherds are made of porcelain clay body unless indicated otherwise, and most are fragments of some type of Tableware vessel, especially tea cups or rice bowls. Many exhibit unique and enticing fragments of different ceramic designs and patterns not yet discussed, further highlighting the richness and diversity of the N-5 collection as well as of the relative affluence and importance of San Francisco's Chinatown during the 1880s.

N5-I-75: Rim sherd; cobalt transfer pattern; possibly Japanese manufactured ware (Adrian and Mary Praetzellis, personal communication); about 2.6 cm. h. (hereinafter, whenever possible, height or length dimension will precede diameter or width).

N5-L-95: Body sherd; cobalt transfer pattern; possibly Japanese (Adrian and Mary Praetzellis, personal communication); 2.2 by 2.5 cm.

N5-L-259: Rim sherd, probably from a tea cup; handpainted cobalt of a floral-like scene with a single line below the rim; 3.5 by about 6 cm. rim dia.

N5-L-279: Rim to base curve fragment; polychrome floral design in pink, and rose overglaze paint along with green, orange, yellow, and black (the original color of the black is unknown) enamel; thin line of gold overglaze on the rim. According to Praetzellis, this sherd may be considered an example of "Canton" ware, and Chace notes that this ware type is rare in the camp sites of Chinese railroad workers (personal communication).

N5-M-183: One body and two rim sherds; plain, glazed; 3.2 to 1.6 cm.

N5-M-184: Rim sherd, possibly a plate; flowered diamond-work ground (Williams 1931: 102A); figurative scene; overglaze enamel in rose, green, and browns; 3.3 by 4.6 cm.

N5-M-195: Fragment of a foot, possibly from a tea cup; plain glazed with the exception of the foot ring; a red overglaze rectangular mark which cannot be translated about 2.2 by 4 cm. foot dia.

N5-M-367: Foot fragment, possibly of a tea cup; rectangular seal in red overglaze enamel, two vertical lines on either side of a character which appears to be a **mi**, or rice (Fenn 1966: 338); about 2.7 by 3.9 cm. foot dia.

N5-M-524: Rim to part of the foot, probably from a wine cup; hand-painted with a cobalt underglaze; possibly a depictive or figurative scene; 3.4 cm. height, 4 cm. maximum diameter, 3 cm. foot dia.

N5-M-532: Body sherd; blue-green cast to the glaze suggests affiliation with a cobalt underglaze; 4.9 by 3.2 cm.

N5-N-463: Rim to base fragment, probably from a tea cup; handpainted floral pattern in overglaze enamels in green pink, rose, and gold with a single line in orange-red at the rim in an overglaze paint; possible gold on the rim originally; black overglaze paint applied over the green enamel for greater detail; "famille rose" type (Holly Holtz, personal communication); 4.8 cm., 5 to 6 cm. rim dia.

N5-P-247: Rim sherd, possibly of a jar; handpainted with a light shade of blue painted with a cobalt underglaze; floral pattern with a marked curvilinear emphasis; 3.1 cm., 9 cm. rim dia.

N5-T-51: Rim sherd, probably from a rice bowl; handpainted cobalt blue underglaze; a horizontal line near the rim; double vertical line with a vertical zigzag and interior band near the rim and an irregular line filling in the space suggests rectangles; 5.8 cm., 10 to 12 cm. rim dia.

N5-U-327: Rim sherd, probably from a bowl; handpainted cobalt underglazed cast to the glaze which ends 1.2 cm. below the rim; stylized curvilinear border with flower below patterns is similar to "Tree and Double Good Fortune" patterns found in the Riverside collection of Chinese material (Chace, personal communication); possibly Japanese (Philip Choy, personal communication); 4 cm. 1., 5.15, 9 cm. rim dia.

N5-U-428: Fragment of a foot, probable tea cup; porcellaneous stoneware; cobalt blue underglaze with a marked greenish cast to the glaze; handpainted design, but features obscured by small sherd size; two encircling lines at the base angle; the interior bottom or well has a mark which resembles an X; a black residue suggests a secondary use of the sherd; 1.8 cm. h., 2.9 cm. foot dia.

N5-U-499: Body sherd, possibly from a tea pot; an overall celedon glaze over which a white and a handpainted cobalt blue curvilinear design was applied and refired; interior glaze color of buff to white shade; no known ware name (Holly Hottz, personal communication); 2.8 by 4.7 cm.

N5-U-645: Body sherd, possibly of a jar or bowl; handpainted with underglazed cobalt; probable figurative scene, sherd size obscures pattern; 2.5 by 5.2 cm.

N5-Z-117: Foot to body sherd, probably of a bowl; presumably decorated with a red overglaze paint (now faded); extremely faded rectangular seal mark in red overglaze paint; 4.1 cm., 4 cm. rim dia.

N5-EE-201: Fragment of a foot, probably of a rice bowl; a faint, now dull orange overglaze enamel on the exterior; rectangular mark in red overglaze paint, the first character which may be translated as **Ch'eng**, a surname (Fenn 1966: 29); the second and third of unknown meaning; and the fourth **tsao**, "made" (this) Fenn 1966: 546); 2.8 cm., 5 cm. foot dia.

Miscellaneous Bowl Covers:

N5-M-174: "Bamboo" pattern executed with a black and black-brown overglaze enamel; faded rectangular seal mark in red overglaze enamel contains the character **ch'ing**, or the "color of nature" (Fenn 1966: 82; Julia M. Andrews and Holly Holtz, personal communication); similar corresponding bowl: N5-Y-72; 3.2 cm. h., 10 cm. rim dia., 4 cm. foot dia.

N5-M-271: "Swirl" pattern painted with a cobalt blue underglaze; indecipherable rectangular seal mark in cobalt; corresponding bowl: N5-U-615 (see Swirl-Double Happiness Stoneware); 3.2 cm. h., 9 to 11 cm. rim dia., 3.9 cm. foot dia.

N5-M-685: "Long Branch with Large Eyed Animal" pattern of overglaze enamel painted in black, coral-red, and green, along with outlines in brown-black; faded rectangular seal mark in red overglaze enamel may include **san**, or "three" (Fenn 1966: 428); the name of a person (for example, the third son within a family), or a particular kiln (Julia M. Andrews and Holly Holtz, personal communication); possible corresponding bowl: N5-Z-115; 2.9 cm. h., 9.1 cm. rim dia., 4.5 cm. foot dia.

N5-N-730: "Two Children and Rattle" pattern; painted with a fine line in orange, green, brown, and black overglaze enamels; the rectangular seal mark in red overglaze enamel resembles a T'ung-Chih reign mark (Julia M. Andrews, personal communication); 2.4 cm. h., about 8 cm. rim dia., 3.6 cm. foot dia.

N5-P-221: "Long Branch" variant pattern which shows a black overglaze enamel in addition to a small amount of green and outlining in brown-black overglaze enamel; undecipherable faded rectangular seal mark; possible corresponding bowl: N5-Z-115 (see also cover N5-M-685).

N5-U-220: "Crab" pattern in which crabs alternate in orientation; executed in brown-black and green overglaze enamels; faded rectangular seal mark in red overglaze enamel which may have the character **shan**, meaning "mountain", placed between the flanking vertical lines (Fenn 1966: 434; Julia M. Andres and Holly Holtz, personal communication); corresponding bowls: N5-N-538 and N5-0-31.

N5-V-75: "Green Mottled" pattern painted on the exterior with a green overglaze enamel which varies in thickness (perhaps a late example of the "Peacock Green" glaze--see Medley 1964: 79); faded rectangular seal in red overglaze enamel which is incomplete but includes the second character of the T'ung-Chih reign mark (1862 to 1875) (Honey 1927: 104; Holly Holtz, personal communication); 2.8 cm. h., about 9 cm. rim dia., about 4.2 cm. foot dia.

N5-W-13: "Four Gentlemen" resist pattern with a plum, bamboo, and chrysanthemum painted with a coral-red overglaze enamel; the fading red overglaze enamel reign mark of T'ung-Chih period (Fenn 1966: XXVI; Julia M. Andrews and Holly Holtz, personal communication); corresponding bowl: N5-W-14; 2.8 cm. h., about 9 cm. rim dia., 4 cm. foot dia.

N5-Y-43 with N5-M-531: "Swirl" pattern executed with a cobalt blue underglaze stain (see "Swirl" section for discussion of pattern); foot missing; see also other cover: N5-M-271; corresponding bowl: N5-U-615; about 9 to 10 cm. rim dia.

N5-Y-70B: "Plants and Characters" resist pattern, depicting an orchid with an overall coral-red overglaze enamel; only a corner of the rectangular seal in red overglaze enamel present; of the seven characters appearing in the seal in the form 1 6 4 1, five may be
7 5 2
3

translated: (1) **shou,** "hand"; (2) **hsi,** to "lead by the hand"; (3) indecipherable; (4) **hui,** "kindness", "benefit"; (5) indecipherable; (6) **san,** "three"; and (7) **tsai,** "plants" (Fenn 1966: 458, 160, 210, 428, and 537). Corresponding bowl: N5-EE-202; 2.85 cm. h., about 9 cm. rim dia., 4.1 cm. foot dia.

APPENDIX D

EUROPEAN STYLE CERAMICS FROM SAN FRANCISCO AND COMPARATIVE SITES IN THE WESTERN UNITED STATES

During the laboratory analysis of European style ceramic artifacts recovered from the N-5 dump site and elsewhere along the sewer alignment, a significant body of data was compiled. By far the bulk of these ceramic pieces were various kinds of utilitarian tableware items.

Much of the data collected on these artifacts focuses on the identification of pottery manufacturers' or makers' marks. Generally, such imprinted or impressed marks, which appear on the bases of ceramic vessels, provide vital information on the name and place of manufacture. In turn, this information can be used to date the ceramic artifact and, hence, often the site itself. However, since this type of data is pertinent primarily to research scholars, little attempt was made to fully discuss this material in Chapter 10 on European style ceramics. Instead, this extensive body of data for specialists in the field of ceramic analysis and historical archaeology is presented here in Appendix D in a series of related tables and graphs.

Appendix D contains 16 separate tables highlighting various aspects of the European style pottery recovered at the San Francisco sewer sites. The tabulation of the data roughly falls into 3 groupings. The first set, Tables 10.01 through 10.07, focus on identifying the pottery by means of the makers' marks found on the ceramics recovered from N-5 and the Channel Outfalls alignments--namely, C-1, C-2, C-4, and the Channel Pump Station (CP). From these tables we learn the names of the pottery manufacturers, the places of production, and the dates when a particular factory was in operation. We also gain insights into the types of ceramic wares being used in the city during the last century.

Table 10.06 indicates the types of other devices besides marks found on the ceramics that can be used for identification, and Table 10.07 provides information on the different moulded and printed patterns appearing on the European style ceramics in the archaeological collection.

The next set, Tables 10.08 through 10.12, are included for purposes of scientific comparison. Tables 10.08, 10.09, and 10.10 present data on similar ceramics recovered at San Francisco's Southeast Sewer Outfalls site, not specifically covered in this three-volume work. Tables 10.11 and 10.12 codify a wide range of data comparing the European style ceramics from N-5 and the Channel fill sites with 14 other Euro-American pottery collections from sites in the Western United States. Examination of this series of tables offers researchers a broad comparative data base from which they can make formal archaeological generalizations regarding the use and distribution of nineteenth-century Anglo-American pottery.

Finally, Tables 10.13 through 10.16 present detailed descriptive material on the transfer-printed pot lids and the ceramic crucibles recovered from the N-5 and the Channel fill sites, respectively.

In essence, all of the tables in Appendix D present an array of crucial data relevant to an understanding of the European style ceramics recovered from San Francisco's Wastewater Management Program. They provide a convenient way in which to concisely "view" the pottery collection. In order to facilitate the location of a required table the following list is given:

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TABLE 10.01

N-5 ALIGNMENT MAKERS' MARKS TIMELINE

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Manufacturer                  1830      1840      1850      1860      1870      1880      1890      1900      1910
                              123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

William Adams                                       *************
William Adams & Sons                                                                           *******************
Henry Alcock & Co.                                          ********************
                                                                                          **********
Richard Alcock                                                               (?)****
Samuel Alcock & Co.                                  *
Charles G. Baker    (Nineteenth century)
Bates, Elliot & Co.                                                  *****
T. & R. Boote                            *****************************************************************
                                                                                         *****************
Henry Burgess                                                  *****************************
E. & C. Challinor                                            ******************************
Edward Clarke                                                    *************
                                                                        *
                                                                             ***
                                                                            *
                                                                               *******
Robert Cochran & Co.                          ***********************************************************************
Creil                         (?)
"E"                           (?)
James Edwards & Son                               ********************************
John Edwards                                                                   *********************
"Excelsior"                                                               (C.) *
Glasgow Pottery                                               ****************************
(Stephens & Tams)
Charles Field Haviland                                                     *  *                    *********************--1941
Hope & Carter                                                ******************* 
Thomas Huges                                               ***********************************
J. E. Jeffords & Co.                                               **********************************
George Jones                                                *************
George Jones & Sons                                                     *******************
Knowles, Taylor & Knowles                          *********************************************************************--1926
John Maddock & Sons                                   ***(?)                                   ****(?)    *************
Maddock & Gater               (?)
Alfred Meakin                                                        ************
Charles Meakin                                                       ********************
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TABLE 10.01 (con't)

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Manufacturer                    1830      1840      1850      1860      1870      1880      1890      1900      1910
                                123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

J. & G. Meakin                                      ****(?)                           ***(?)
Myott, Son & Co.                                                                                   ***(?)
Powell & Bishop                                     ************
G. Wooliscroft                                      ***      ****
Union Porcelain Works                                                        ***********************
(Thomas C. Smith & Sons)
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TABLE 10.02
N-5 ALIGNMENT MAKERS' MARKS

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
William Adams Tunstall, Staffordshire	N5-U-622	Printed. The Victorian Royal Arms (seated) above "WILLIAM ADAMS" above "IRONSTONE CHINA" in a festooned ribbon on either side of "TUNSTALL". Corresponds to Praetzellis 1979: 2, Mark 1.	1853-1865
William Adams & Sons Tunstall, Staffordshire	N5-M-553 N5-N-205 N5-N-552	Printed. "IRONSTONE CHINA" above the Victorian Royal Arms (standing) above "ADAMS" above "TUNSTALL" above "ENGLAND". Corresponds to Praetzellis 1979: 3, Mark 1. Mark illustrated Godden 1964: 22, Mark 35.	1896-1914
Henry Alcock & Co. Cobridge, Staffordshire	N5-U-388	Impressed. "H.A. & Co." with three short vertical lines incised about .8 cm. above the mark. Mark illustrated in Godden 1964: 27, Mark 64.	1861-1880
	N5-M-731 N5-N-211	Printed. "WHITE GRANITE" above the Victorian Royal Arms (standing) above "HENRY ALCOCK & Co." above "COBRIDGE ENGLAND". Corresponds to Praetzellis 1979; 4, Mark 3. Mark illustrated Wetherbee 1974: 85, Mark 1 (reference from Praetzellis 1979: 4).	1891-1900
Richard Alcock Burselm, Staffordshire	N5-W-9	Printed. Victorian Royal Arms (standing) above "RICHARD AL(COCK)" above "BURSELM ENGLAND" with "WARRAN(TED)" placed vertically along the right side. Date according to Godden 1964:672, based on change to A. J. Wilkinson.	? - 1885
Samuel Alcock & Co. Burselm, Staffordshire	N5-V-115	Impressed. Registry diamond which may be deciphered as September 5th, 1854, parcel number "3" above "S. ALCOCK & Co." (Godden 1964: 28, 527; Cushion 1976:301).	September 5, 1854
Charles G. Baker Burselm, Staffordshire	N5-M-552	Printed. "(CHAR)LES G. BAKER BURSLEM ENGLAND" in an arch above the Victorian Royal Arms (standing) above "....(I)MPERIAL..." (mark incomplete). Approximate date (according to Godden 1964:11) on the basis of the Royal Arms being associated with the	Nineteenth Century

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Bates, Elliot & Co. Burslem, Staffordshire	N5-Y-17	Impressed, "BATES, ELLIOT & CO" above "POTTERS" in addition to the irregular placement of a number "14" and "0/4" and an "M" located toward the upper left of the impressed mark. Date according to Wakefield 1962: 173.	1870-1875
T. & R. Boote Burslem, Staffordshire	N5-M-40	Impressed. Registry diamond which may be deciphered as August 22, 1856, parcel number 4 within the center of a circle. Above "(T. & R. BOOTE" and "UNION SHAPE" below, the latter refers to the pattern name (Cushion 1976: 303; Godden 1964:527).	August 22, 1856
T. & R. Boote	N5-L-124	Printed in brown. "WATERLOO (POTTERIES)" above "TRADE MARK" above shield device above "ROYAL PREMIUM" above "SEMI-PORCELAIN" above "T. & R.) BOOTE" above "(ENGLAND). Similar to Praetzellis 1979: 7, Mark 4, but without "Waterloo". Mark illustrated in Godden 1964: 84, Mark 439.	1890-1906
	N5-N-738	Printed, "TRADE MARK" above a "talbot couchant" framed by rising foliage on either side, above "T. & R. BOOTE" above "ROYAL PATE(NT)" above "IRONST(ONE)". Corresponds to Praetzellis 1979: 7, Mark 5. Mark illustrated Godden 1964: 84, Mark 440. Also an impressed mark: "T. & R.B" above the printed mark, at an oblique angle.	1890-1906
	N5-N-807	Printed. The Victorian Royal Arms (standing) above "ROYAL PATENT" above "IRONSTONE." above "T. & R. BOOTE.". Corresponds to Praetzellis 1979: 7, Mark 3.	1842-1906
Henry Burgess Burslem, Staffordshire	N5-U-445 N5-Y-77	Printed. The Victorian Royal Arms (standing) above "H. BURGESS. BURSLEM.". Corresponds to Praetzellis 1979: 9, Mark 1.	1864-1892

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
E. & C. Challinor Fenton Staffordshire	N5-M-274 N5-N-206	Printed. The Victorian Royal Arms above "STONE CHINA" above "E & C. CHALLINOR" above "ENGLAND". Corresponds to Praetzellis 1979; 9, Mark 3.	1862-1891
	N5-M-730	Printed. Incomplete "STONE CHINA" above "E & C. CHALLINOR" above "FENTON". Date according to Cushion 1976: 136.	1862-1891
Edward Clarke Tunstall, Staffordshire	N5-LP-15	Printed. "TRADE MARK" above twin shield device above a wreath (or foliage) above a festooned ribbon inside of which "EDWARD CLARKE" above "TUNSTALL" (also within the ribbon, but placed below), above "OPAQUE PORCELAINE". Corresponds to Praetzellis 1979: 11, Mark 6 (1865-1877). Impressed mark placed above the printed mark. "EDWARD CLARKE" above "1'73" which may be deciphered as January of 1873 (Godden 1964: 12).	January 1873
	N5-LP-13 N5-P-222 N5-U-623	Printed. "EDWARD CLARKE" above "TUNSTALL" above "TRADE MARK" above a twin shields device above a wreath (or foilage) above "STONE CHINA". Corresponds to Praetzellis 1979: 11, Mark 7.	1865-1877
	N5-M-549	Same printed mark as N5-LP-13 in addition to an impressed "E" CLARKE" placed to the right at right angle.	
Longport, Staffordshire	N5-M-60	Printed. "TRADE MARK" above twin shield device above "STONE CHINA" above "EDWARD CLARKE" above "LONGPORT. ENGLAND". Mark similar to Godden 1964: 147, Mark 895. Date according to Godden 1964: 147.	1878-1880
	N5-N-553	Same printed mark as N5-M-60 in addition to an impressed mark: "EDWARD CLAR(KE)" above "11.77" place to the left of the printed mark near the base ridge. Note discrepancy between dates attributed to printed and impressed marks.	November 1877

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Edward Clarke Burslem, Staffordshire	N5-H-2 N5-N-188	Printed, "TRADE MARK" above the twin shields device above "STONE CHINA" above "EDWARD CLARKE" above "BURSLEM ENGLAND". Similar to Praetzellis 1979: 11, Mark 8. Mark illustrated in Godden 1964: 147, Mark 895.	1880-1887
Robert Cochran & Co. Glasgow, Scotland	N5-U-679	Printed. The Victorian Royal Arms (seated) above "WARRANTED STONE CHINA" above "R. COCHRAN & (CO. GLASGOW)". Corresponds to Praetzellis 1979: 12, Mark 1.	1846-1918
	N5-U-424	Printed in blue. "WARRANTED STONE CHINA" above seated Victorian Royal Arms above "R. COCHRAN & CO." above "GLASGOW".	(1846-1918)
	N5-L-206 N5-L-282 N5-M-422 N5-N-60	Printed. "ROBERT COCHRAN & C$^{\underline{o}}$ GLASGOW" arranged in an arch above the Victorian Royal Arms (standing) above "IMPERIAL" above "IRONSTONE CHINA". Corresponds to Praetzellis 1979: 13, Mark 5.	
	N5-M-550	Same printed mark as N5-L-206 in addition to an impressed "...STONE CHIN(A)" above two lines of illegible characters. This impressed mark is placed to the left and at a right angle above the printed mark.	
Creil Montereau, France	N5-M-342	Printed in green. A kylix shape with "E & C$^{\underline{ie}}$" within the interior and "DEPOSE" on the exterior above "CREIL ET MON(TER)EAU" placed about midway along the enlongated stem. See Chaffers 1974: vol. 1:184.	
"E"	N5-M-474	Impressed "E" within a circle on the base of a Rockingham glazed teapot of the "Rebecca at the Well" pattern.	
James Edwards & Son Burslem, Staffordshire	N5-M-548	Printed. Victorian Royal Arms (seated) above "STONE CHINA" above "JAMES EDWARDS & SON" above "DALEHALL". Corresponds to Praetzellis 1979: 19, Mark 2. Above a printed anchor with "TRADE MARK" placed about midway along the shank (incomplete).	1851-1882

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
John Edwards Fenton, Staffordshire	N5-AH-3 N5-M-168 N5-U-392	Printed in brown. "PORCELAINE DE TERRE" above "TRADE MARK" above a complex shield with an eagle in the center, above "JOHN EDWARDS". All phrases are arranged in a circle. Generally corresponds to Praetzellis 1979; 19, Mark 3, but lacks the "ENGLAND" and "OPHIR".	1880-1900
"Excelsior"	N5-V-9	Printed in very faded black. "EXCELSIOR" in an arch above "SHAVING MUG" above "PAT. SEPT 20, 18(8?)0" arranged in arch. "Excelsior" may refer to pattern name.	c. Sept. 20, 1880
Glasgow Pottery (John Moses & Sons) Trenton, New Jersey	N5-U-113	Printed. The Victorian Royal Arms (seated) above "IRONSTONE CHINA" above "J. M. & Co.". Mark illustrated in Maddock's 1910; 220, Mark 133. Date according to Ketchum 1971: 177 (1860 - 1890).	1863-1890
Greenwood Pottery (Stephens & Tams) Trenton, New Jersey	N5-L-22	Impressed. "GREENWOOD" above "TRENTON N. (J.)" above a short horizontal line. Similar to mark illustrated in Maddock's 1910: 203, Mark 94. Date according to Ramsay 1947: 182.	1876-1900
Charles Field Haviland Limoges, France	N5-N-550	Printed in green. "H & C^{o}" above a horizontal line above "L". Mark illustrated in Kovel 1953: 59i.	c.1879
	N5-M-425	Printed in green. "G D A" in stylized script above a horizontal line above "FRANCE". This mark is located in the center. Mark illustrated in Kovel 1953: 51m.	1842-1898
		In addition printed in red located above and to the right of the green mark. "G D A" above a horizontal line, "LIMOGES", all contained within a victory wreath. Mark illustrated in Kovel 1953: 180f.	1900-1941

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Hope & Carter Burslem, Staffordshire	N5-N-728	Printed. "STONE CHINA" above the Victorian Royal Arms (seated) above "HOPE & CARTER" above "BURSLEM". Corresponds to Praetzellis 1979: 25, Mark 1. Also an illegible impressed mark under "stone" and part of the crest (on account of a diagonal alignment).	1862-1880
	N5-U-444	Printed. Incomplete, with possible Victorian Royal Arms above "IMPERIAL" above "IRONSTONE CHINA" above "HOPE & CARTER".	
Thomas Hughes Burslem, Staffordshire	N5-M-202 N5-N-500 N5-U-435 N5-U-616	Printed. "IRONSTONE CHINA" above the Victorian Arms (standing) above "THOMAS HUGHES". Corresponds to Praetzellis 1979: 25, Mark 2.	1860-1894
	N5-P-201	In addition to the printed mark of N5-M-202, an impressed number "11" or "II" under the lion's head.	
	N5-L-123 N5-N-193 N5-N-210	Printed. Lion in a shield above "TRADE MARK" above "THOMAS HUGHES" above "ENGLAND". Corresponds to Praetzellis 1979: 25, Mark 3.	
	N5-M-59	Impressed. "THOMAS HUGHES" in an arch above a dot flanked by a triangular shape on either side, above "BURSLEM" above a number which cannot be deciphered; a possible number "73" is impressed at the opposite end.	
	N5-N-470	Same as N5-M-59, but with a number "2" below the "BURSLEM".	
	N5-U-135	Same as N5-M-59, but with a number "7" below the "BURSLEM". Similar to Praetzellis 1979: 25, Mark 5.	
	N5-U-17	Printed Mark of N5-M-202 and the impressed mark of N5-M-59.	
	N5-U-442	Printed mark of N5-M-202 and the impressed mark of N5-M-59 with a number "1" below and a probable number "77" above.	

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
J. E. Jeffords & Co. Philadelphia, Pennsylvania	N5-N-520 N5-P-736 N5-U-426 N5-X-16	Printed in blue-green. "WARRANTED" above a diamond with a single "J" and "P" on either side of the corner reinforcement devices, filled with a stylized "J" and "CO" aligned vertically and a number "6" in the upper left and "8" in the lower right; above "FIREPROOF". On yellow ware with a blurred application. Mark illustrated Maddock's 1910: 202, Mark 38. Date according to Ketchum 1971: 186.	c.1868-1901
George Jones Stoke-on-Trent, Staffordshire	N5-X-12	Printed. Victorian Royal Arms (standing) above "ROYAL PATENT" above "IRONSTONE" above "GEORGE JONES". Corresponds to Praetzellis 1979: 26, Mark 1	1861-1873
George Jones & Sons Stoke-on-Trent, Staffordshire	N5-W-15	Printed. The Victorian Royal Arms (standing) above "ROYAL PATENT" above "IRONSTONE" above "GEORGE JONES & SONS." Similar to Praetzellis 1979: 26, Mark 1 with the addition of "Sons".	1873-1891
Knowles, Taylor and Knowles East Liverpool, Ohio	N5-I-24	Printed. "HOTEL" above "IRON STONE CHINA" above a medal or medallion with a bird (dove?) with out-stretched wing placed within the interior and holding olive branches; above "KNOWLES, TAYLOR" above "AND" above "KNOWLES". Most similar illustration in Maddock's 1910: 222, Mark 420.	1852-1926
	N5-L-281	Printed in brown. "K.T. & K." above a horizontal line above "CHINA". Mark illustrated in Maddock's 1910: 211, Mark 435. Date according to Ketchum 1971: 184.	
John Maddock & Sons Burslem, Staffordshire	N5-U-443	Printed. Incomplete with an enclosed circle, the rim of which contains "MADDOCK & (SONS)". Within the circle "TRADE MARK)" above a Royal Victorian Arms (standing) ...(incomplete). Not discussed by Godden 1964: 406-407 or Praetzellis 1979: 28-29.	1855-

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
John Maddock & Sons Burslem! Staffordshire	N5-M-55	Printed in green. A lion (now missing) above "VITRIFIED" found within a festooned ribbon above "JOHN MADDOCK & SONS" above "ENGLAND". Mark incomplete but probably extremely similar to Godden 1964: 406, Mark 2465 (lacking "Ltd.").	c.1896+
	N5-U-132	Printed. Crown sitting on a sceptre which is in turn sitting on a cushion with tassels and fringes, above "TRADE MARK" above "ROYAL. SEMI PORCELAIN" above "JOHN MADDOCK & SONS" above "ENGLAND". Corresponds to Praetzellis 1979: 29, Mark 3.	1906-
	N5-M-686	Printed. The same crown, sceptre, but cushion with a different surface treatment (see Godden 1964: 406, Mark 2467) above "TRADE MARK" above "JOHN MADDOCK & SONS" above "STAFFORDSHIRE POTTERIES" above "ENGLAND". Corresponds to Praetzellis 1979: 29, Mark 4.	1906-
Maddock & Gater ? Staffordshire	N5-P-215	Impressed. An enclosed circle, the rim of which contains "MADDOCK & GATER." above "STAFFORDSHIRE POTTERIES"; within the circle "TRADE MARK" above the Victorian Royal Arms (standing).	?
Alfred Meakin Tunstall, Staffordshire	N5-M-736	Printed. Incomplete, standing Victorian Royal Arms above "A. MEAKIN" placed slightly off-center, above "ENGLAND". Date according to Godden 1964: 425.	1875-1896
Charles Meakin Burslem,	N5-N-452 N5-N-453 N5-Z-174	Printed. Seated Victorian Royal Arms (with shield off-center to the right) above "IRONSTONE CHINA" above Staffordshire "C. MEAKIN, BURSLEM". Corresponds to Praetzellis 1979: 32, Mark 4.	1870-1882
	N5-M-737	Printed. The Victorian Royal Arms (standing) above "CHARLES MEAKIN" above "(BURSLE)M.ENGLAND". Mark extremeley similar to Godden 1964: 426, Mark 2596 (substitution of Burslem for Hanley).	

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Burslem or Hanley, Staffordshire	N-U-368 N5-Z-141a	Printed. "WARRANTED" above "ROYAL IRONSTONE CHINA" above the Victorian Royal Arms (standing) above "CHARLES MEAKIN" above "ENGLAND". Corresponds to Praetzellis 1979:32, Mark 5.	1870-1889
Charles Meakin Burslem or Hanley Staffordshire	N5-L-190 N5-Z-141g	Printed. Incomplete with "(IRONSTO)NE CHINA" above the Victorian Royal arms (standing) above "CHARLES M(EAKIN)"...incomplete.	1870-1889
J. & G. Meakin Hanley, Staffordshire	N5-Z-173	Printed. "IRONSTONE CHINA" above "V" and "R" above and associated with the Victorian Royal Arms (standing) above "J. & G. MEAKIN" above "ENGLAND". Also an impressed mark placed in the center of the base. a number "12" above "J & G MEAKIN". Impressed mark similar to Praetzellis 1979: 32, Mark 1 (number missing).	1851-
	N5-N-727	Printed. Victorian Royal Arms (seated) above "IRONSTONE CHINA" above "J. & G. MEAKIN". Corresponds to Praetzellis 1979: 32 Mark 2.	1851-
	N5-U-446	Printed. "IRONSTONE CHINA" above the Victorian Royal Arms (standing) above "J. & G. MEAKIN" above "HANLEY" above "ENGLAND". Corresponds to Praetzellis 1979: 32, Mark 4. Mark illustrated Godden 1964: 427, Mark 2601.	c.1890+
	N5-L-121 N5-N-207	Same printed mark as N5-U-446, lacks the J. & G., but probably from the same pottery.	
Myott, Son & Co. Stoke & Cobridge, Hanley, Staffordshire	N5-L-20	Printed. "M & S" above a horizontal line, above "E". Identification by Wakefield 1962: 178. Date according to Cushion 1976: 236 and Godden 1964: 457. An impressed circular device (illegible) located to the left of the printed mark.	1898

TABLE 10.02 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Powell & Bishop Hanley, Staffordshire	N5-N-555 N5-N-556	Printed. A garter and crown device with "IRONSTONE CHINA" within a triangular shape above "POWELL & BISHOP" within a bifurcated ribbon. Corresponds to Praetzellis 1979: 36, Mark 2 Mark illustrated in Godden 1964: 509, Mark 3136. Date as presented by Praetzellis 1979: 36.	1867-1878
Union Porcelain Works (Thomas C. Smith & Sons) New York City, New York	N5-J-4	Printed in green. "U.P.W." above an eagle head holding a snake by the beak. Mark illustrated in Kovel 1953: 160f and Maddock's 1910: 208, Mark 288. Date according to Ramsay 1947: 198.	1876-1900
George Wooliscroft Tunstall, Staffordshire	N5-V-147	Impressed. The Victorian Royal Arms (seated) above a scroll device with "IRONSTONE CHINA" above "G. WOOLIS (CROFT)".	1851-1853 1860-1864

TABLE 10.03

CHANNEL ALIGNMENT AND CHANNEL PUMP STATION MAKERS' MARKS TIMELINE

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Manufacturer                  1830      1840      1850      1860      1870      1880      1890      1900      1910
                              123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

Adams                         (Nineteenth century)
William Adams                                       *************
Henry Alcock & Co.                                          *******************************
                                                                                          ********************
T. & R. Boote                            *****************************************************************
                                                     *
                                                                     *
                                                                                         *****************

Brockman Pottery Co.                                         ***************************************
Cauldon Potteries                                                                         ****************************** 1953
E. & C. Challinor                                            ******************************
Chester Pottery Co.                                                                            ***(?)
Robert Cochran & Co.                         ************************************************************************** (1918)
Creil                         (?)
Davenport                     *********************************************************
Doulton                                                                                              *
                                                                                              **

James Dudson                         ****************************************************
John Edwards                                  ******************************************************
Thomas Furnival & Co.                     ***
Thomas Furnival & Sons                                                        ********************
Greenwood Pottery                                                                  *************************
(Stephens & Tams)
Charles Field Haviland                                                          *
                                                                               *

Thomas Hughes                                                ***********************************
J. E. Jeffords & Co.                                                **********************************
Johnson Bros.                                                                     *******************************
                                                                                  ***(?)

Knowles, Taylor & Knowles                           ******************************************************************* (1926)
                                                                     ************************************************* (1926)
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TABLE 10.03 (con't)

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Manufacturer                  1830      1840      1850      1860      1870      1880      1890      1900      1910
                              123456789012345678901234567890123456789012345678901234567890123456789012345678901234567890

John Maddock & Sons                                                                *****************
                                                                                               *****(?)
                                                                                                          ****(?)

S. Marchand                   (?)
Charles Meakin                                                       ********************
J. & G. Meakin                                    ***(?)                                 ***(?)
New York City Pottery
"Ohio"                                                   **************
(Carr & Morrison)
Powell & Bishop                                                   ************
Powell, Bishop & Stonier                                                 *
. . .Pritchard                (?)
Union Porcelain Works                                                      *************************
(Thomas C. Smith & Sons)                                                    ************************
Villeroy & Boch               (Nineteenth century)
Wood, Son & Co.                                                     ***********
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TABLE 10.04
CHANNEL ALIGNMENT MAKERS' MARKS

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Adamsㅤ ? Staffordshire	C4-N-36	Printed in a dark blue-black with "IMPERIAL" in festooned ribbon above an eagle with a shield representing the body, holding arrows (right) and an olive branch (left) above "FRENCH PORCELAIN" in a festooned ribbon above "ADAMS". Corresponds to Praetzellis 1979: 2, Mark 1.	Nineteenth Century
William Adams Tunstall, Staffordshire	C4-E-18	*Printed, extremely small fragment with the Victorian Royal Arms, probably seated, above "(WI)LLIAM(ADAMS)" above "(IRONS)TONE (CHINA)" in a festooned ribbon flanking either side of "TUNSTA(LL)". Praetzellis 1979: 2, Mark 1.	1853-1865
Henry Alcock & Co. Cobridge, Staffordshire	C1-U-8	Printed in brown. "PARISIAN PORCELAIN" above a bird within a draped shield over crossed sceptors, above "HENRY ALCOCK & C^{o}". Appears similar to Praetzellis 1979: 4, Mark 2. Date according to Godden 1964: 26-27.	1861-1891
	C1-F-3	Printed in brown. Incomplete with "PARISIAN PROCELAIN" above "HENRY ALCOCK & Co." above "ENGLAND.". Appears similar to Praetzellis 1979: 4, Mark 2. Date according to Godden 1964: 27.	1891-1910
T. & R. Boote Burslem, Staffordshire	C1-L-12	Impressed. Circle within interior bank of "IRONSTONE" "(T. &) R. BOOTE" with "II" placed in the center. Related to Praetzellis 1979: 7, Mark 1, but with no mention of the interior filler.	1842-1906

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
T. & R. Boote Burslem, Staffordshire	C4-B-62	Impressed. Registry Diamond with a circle, around the interior periphery "T & R BOOTE" and an illegible word above "SYDENHAM.". The Registry mark may be deciphered as September 3, 1853 the second parcel (Godden 1964: 527).	September 3, 1853
	CP-13	Printed. Registry diamond with "SENATE" above and "T & R BOOTE" placed on the lower left with "BURSLEM" along the lower right side of the diamond. The Registry mark may be deciphered as November 26, 1870, the ninth parcel number (Godden Ibid.).	November 26, 1870
	C1-FF-?	Printed in brown. Shield device above "ROYAL PREMIUM" above "T & R. BOOTE" above "ENGLAND". Similar to Praetzellis 1979: 7, Mark 4, but lacks the "TRADE MARK".	1890-1906
	C2-B-38	Printed in brown. Incomplete with part of shield design above "ROYAL PREMIUM" above "SEMI-PORCELAIN" above "T & R BOOTE" above "ENGLAND". Corresponds to Praetzellis 1979: 7, Mark 4 and may be the same mark as C1-FF-7.	1890-1906
Brockman Pottery Co. Cincinnati, Ohio	CP-A-47	Printed. "WARRANTED BEST IRONSTONE CHINA" in an arch above the Royal Victorian Arms (seated) above "T.B.&Co.". Mark similar to Maddock's 1910: 213, Mark 526, but with a last line of "B.P.Co.". Date according to Maddock's 1910: 222 and Ramsay 1947: 211.	1862-1900

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Cauldon Potteries Stoke-on-Trent, Staffordshire	C2-43	Impressed. "CAULDON" placed in the center of the base. Printed in blue "CAULDON" placed at an oblique angle toward the upper right. Date according to Kovel 1953: 200.	1891-1953
E. & C. Challinor Fenton, Staffordshire	C4-E-27 C4-N-23	*Printed. Victorian Royal arms (standing) above "STONE CHINA" above "E. & C. CHALLINOR" above "ENGLAND". Corresponds to Praetzellis 1979: 9, Mark 3.	1862-1891
	CP-A-50	Printed. Victorian Royal Arms (seated) above "STONE C(HINA)" above "E. & C. CHA(LLINOR)" above "ENGL(AND)". Corresponds to Praetzellis 1979: 9, Mark 2.	1862-1891
Chester Pottery Co. Phoenixville, Pennsylvania	C2-C-30	Printed in green. "CHEST(ER)" within a circle above "HOT(EL)" (placed horizontally in the center) above "CHI(NA)". Date according to Maddock's 1910: 219.	1894-
Robert Cochran & Co. Glasgow, Scotland	C1-FF-8 C4-B-146 C4-H-11 C4-AB-5	*Printed. "ROBERT COCHRAN & Co GLASGOW" arranged in an arch above the Victorian Royal Arms (standing) above "IMPERIAL" above "IRONSTONE CHINA". Similar to Praetzellis 1979: 13, Mark 5.	1846-1918
Creil Montereau, France	CP-14	Printed in green. "MADE IN FRANCE" above a kylix and "CREIL ET MONT(ER)EAU" placed about midway along the stem of the vessel. See Chaffers 1974 vol.1: 184.	?

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Davenport Longport, Staffordshire	C1-V-13	Printed. Victorian Royal Arms (seated) above "IRON STONE" above "DAVENPORT". Corresponds to Praetzellis 1979: 15, Mark 1. Impressed below the printed mark: within two stacked circles "DAVENPORT" above and following the curvature of the circle, an anchor placed in the center, above "IRONSTONE" and "....". In addition, an impressed number "8" located underneath the head of the printed lion.	1830-1887
Doulton Burslem, Staffordshire	C2-B-29 C2-B-37	Printed in green. A lion standing on top of a crown above "ROYAL DOULTON" arranged in a semi-circle above "ENGLAND" flanked by three upturning lines on either side with a four lobed device located in the center. Mark illustrated in Godden 1964: 213, Mark 1333.	c. 1902
	C2-B-36	Same mark, but printed below in blue just touching the Royal Doulton mark (C2-B-29), "NURFOLK" above "R No251612", the latter of which refers to the design registration number. This number is attributed to the period January 1885 - January 1886 (Godden 1964: 527).	January 1895-1896
James Dudson Hanley, Staffordshire	C4-M-30	Impressed. "DUDSON" located on the periphery of the base. Mark illustrated in Godden 1964: 223, Mark 1409.	1838-1888
John Edwards Fenton, Staffordshire	C1-V-11 CP-D-40	Printed. "TRADE MARK" on either side of the top of a Maltese Cross which contains an eagle encircled by the inscription "HONNEUR ET PATRIA". Below the cross "SEMI PORCELAINE." above "JOHN EDWARDS.". Corresponds to Praetzellis 1979: 19, Mark 1.	1847-1900

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
John Edwards Fenton Staffordshire	C4-EF-3	Printed. Extremely incomplete, but appears to be "W(ARRANTED)" above "IRO(NSTONE CHINA)" above Prince of Wales Feathers with "TRADE" placed on the left and ("MARK") probably on the left, above "JOHN ED(WARDS)" above "ENGL(AND)". General correspondence with Praetzellis 1979: 10, Mark 2.	1880-1900
Thomas Furnival & Co. Hanley, Staffordshire	C1-W-7	Printed. "IRONSTONE CHINA" above the Victorian Royal Arms (standing), above "FURNIVAL & Co." with the phrases oriented in a circular fashion. Date according to Godden 1964: 263.	1844-1846
Thomas Furnival & Sons Cobridge, Staffordshire	C1-K-21 C1-JJ-66	Printed. "THOMAS FURNIVAL & SONS" within a festooned ribbon above Victorian Royal Arms (seated) above an anchor flanked by "TRADE MARK" above "ENGLAND" in a festooned ribbon. Date according to Godden 1964: 263 (for an illustration of the lower portion see Mark 1649) Appears to correspond to Praetzellis 1979: 21, Mark 2 with the attributed date of between 1878 and 1890.	1871-1890
Greenwood Pottery (Stephens & Tams) Trenton, New Jersey	C4-B-86	Impressed. "GREENWOOD CHINA" above "TRENTON.N.J". Mark illustrated Maddock's 1910: 203, Mark 94. In Maddock's 1910: 220 as established 1861, but Ramsay 1947: 182 notes "Greenwood Pottery" was not printed until 1876.	1876-1900
Charles Field Haviland Limoges, France	CP-A-38	*Printed in green. "H & C^{O}". Mark illustrated in Kovel 1953: 59i.	c.1879
	C4-B-207	Printed in green. "H&C^{O} above a horizontal line above a shorter horizontal line. Mark illustrated Kovel 1953: 60a.	c.1880

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Thomas Hughes Burslem, Staffordshire	C1-K-20	Printed. "IMPERIAL" in a festooned ribbon above an eagle "with a shield for a body" holding arrows and an olive branch, above "FRENCH PORCELAIN" in a festooned ribbon, above "THOS. HUGHES.". Corresponds to Praetzellis 1979: 25, Mark 1.	1860-1894
		Impressed. Placed below and upside-down in orientation to the printed mark. Appears to be "THOMAS HUGHES" in an arch above a dot flanked by a triangular shape on either side, above "BURSLEM". Similar to Praetzellis 1979: 25, Mark 5.	
	C1-JJ-77	*Printed. Lion in a shield above "TRADE MARK" above "THOMAS HUGHES" above "ENGLAND". Corresponds to Praetzellis 1979: 25, Mark 3.	(1860-1894)
	C4-N-37	Printed. Seated Victorian Royal Arms with the shield slightly to the right, placed in the center of the base.	
		Impressed. Located above to the left, aligned at about a 45° angle "THOMAS HUGHES" in an arch above a dot flanked by a triangular shape on either side, above "BURSLEM". Similar to Praetzellis 1979: 25, Mark 5.	
	CP-A-48	Same as impressed mark above placed off-center and toward the base ridge, but with the addition of a number "79" above center and a number "2" placed below center. Corresponds to Praetzellis 1979: 25, Mark 5.	

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
J.E. Jeffords & Co. Philadelphia, Pennsylvania	C2-B-43	*Printed in blue, fuzzy execution of "WARRANTED" above a diamond filled with a probable stylized "J" and "CO" aligned vertically, above "FIREPROOF" (note the diamond has stylized corners and appear equivalent to the N-5 examples). Mark illustrated Maddock's 1910: 202, Mark 38. Date according to Ketchum 1971: 186	c. 1868-1901
Johnson Bros. Hanley, Tunstall (1899-1913), Staffordshire	C4-M-43	Printed. Incomplete "(ROYAL IRONSTO)NE CHIN(A)" above Victorian Royal Arms (standing), above "JOHNSON BRO$^{\underline{S}}$" above "ENGLAND". Mark illustrated Godden 1964: 355, Mark 2176.	1883-1913
	C2-E-1	Printed in aqua green. " " THE MIKADO" " (quotation marks present), above a crown, above "JOHNSON BROS" above "ENGLAND", along with a letter "C" placed in mis-alignment in the upper left and the number "30" in the upper right.	1883-
Knowles, Taylor, and Knowles East Liverpool, Ohio	C1-Z-13 C2-CD-11	*Printed in brown. "K.T.&K." above a horizontal line above "CHINA". Mark illustrated Maddock's 1910: 211, Mark 435. Date according to Ketchum 1971: 184.	1852-1926
	C2-42	Printed in green. A medal or medallion with a bird (dove?) with out-stretched wings within the interior holding olive branches, around the exterior of the circle "SEMI-VITREOUS PORCELAIN" above "K.T.&K. CO". Mark illustrated in Thorn 1947: 113, no.7. Dating a combination of Thorn 1947: 113 and Ketchum 1971: 184 (c. 1852-1926).	1870-1926

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
John Maddock & Sons Burslem, Staffordshire	C2-B-44	Printed in brown. Crown on top of a circle, within the circle, arranged in an arch, "JOHN MADDOCK & SONS" above "ENGLAND" (placed horizontally in the center), above "ROYAL VITREOUS". Mark illustrated in Godden 1964: 406, Mark 2463. Impressed crown located above near the rim aligned at a right angle to the printed mark.	1880-1896
	C2-E-7 C4-30-31	Printed in green. A lion above "VITRIFIED" found within a festooned ribbon above "JOHN MADDOCK & SONS" above "ENGLAND" above "HEA". Also: "(D)OHRMANN C^{o}" above "(SAN)FRANCISCO" placed upper left or directly above the lion. Mark extremely similar to Godden 1964: 406, Mark 2465, but lack the "Ltd.".	1896+
	C1-JJ-79	Printed. A crown sitting upon a scepter which in turn is placed upon a cushion with tassels and fringe, above "TRADE MARK" above "ROYAL. SEMI. PORCELAIN" above "JOHN MADDOCK & SONS" above "ENGLAND". Corresponds to Praetzellis 1979: 29, Mark 3. Mark illustrated Godden 1964: 406, Mark 2467.	1906-
John Maddock & Sons	C1-B-3	*Printed. Incomplete with the same crown sitting upon a scepter which in turn is placed upon a cushion (with slight variation in the surface treatment), above "(TR)ADE MARK" above "(JOHN MAD)DOCK & SONS" above "(STAFFORDSHIR)E POTTERIES" above "(ENGL)AND". Corresponds to Praetzellis 1979: 39, Mark 4. Impressed. "J.M.&S." place above right, close to the base ridge.	1906-

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
	C1-JJ-30 C1-JJ-31 C4-B-87 C4-H-65 C5-MP-7 CP-A-43	Printed. "ROYAL" in a festooned riboon above a crown above "STONE CHINA" in a festooned ribbon above "MADDOCK & CO" above "BURSELM ENGLAND" above "TRADEMARK". Mark illustrated in Godden 1964: 406, Mark 2466 which also lacks the "& Sons".	1906
S. Marchand San Francisco, California	C4-B-195	Painted. In script style: "S Marchand" above "artist" above "decorator of porcelaine" above "129 Union St. S.F.".	?
Charles Meakin Burslem, Hanley (1882-1889), Staffordshire	C1-JJ-74 C4-H-24	Printed. "WARRANTED" above "ROYAL IRONSTONE CHINA" above the Victorian Royal Arms (standing) above "CHARLES MEAKIN" above "ENGLAND". Corresponds to Praetzellis 1979: 32, Mark 5.	1870-1889
J. & G. Meakin Hanley, Staffordshire	C1-C-5 C1-E-15	Printed. The Victorian Royal Arms (standing) above "IRONSTONE CHINA" above "J.&G. MEAKIN". Corresponds to Praetzellis 1979: 32, Mark 2. Date according to a combination of Cushion 1976: 162 and Godden 1964: 427.	1851
New York City Pottery (Carr & Morrison) New York City, New York	C4-B-61	Printed. "TRADE MARK" above a standing variation of the Royal Victorian Arms with "J" and "C" in the center of the arms above "STONE CHINA". Mark illustrated Kovel 1953: 154j. Date and description according to Ramsay 1947: 198.	1858-1871
"OHIO" ?	C1-JJ-11	Printed in blue. A diamond in which "OHIO" fills the space.	?

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Powell & Bishop Hanley, Staffordshire	C1-JJ-78 C4-F-14	*Printed. A garter and crown combination with "IRONSTONE CHINA" within a triangular device, above "POWELL & BISHOP" within a bifurcated ribbon. Corresponds to Praetzellis 1979: 36, Mark 2, see also Godden 1964: 509, Mark 3136. Date according to Cushion 1976: 160 (Praetzellis 1979: 36).	1867-1878
Powell, Bishop & Stonier Hanley, Staffordshire	C4-K-3	Same printed mark as above (C1-JJ-78), in addition to an applied and then impressed Registry mark which may be deciphered as July 30, 1878, parcel number 6 (Godden 1964: 527; Cushion 1976: 361 for "Stonier").	July 30, 1878
"...Pritchard" Salisbury, ?	C1-I-15	Printed. Incomplete with "..(E).PRITCHARD" above "CHINA" above "WAREHOUSE" above "SALISBURY", all placed within a snaking ribbon held by a pole on the left side.	?
Union Porcelain Works (Thomas C. Smith & Sons) New York City, New York	C1-Z-6 C4-B-78	*Printed in green. "U.P.W." above an eagle head holding a snake by the beak. Mark illustrated in Kovel 1953: 160f and Maddock's 1910: 208, Mark 288. Date according to Ramsay 1947: 198.	1876-1900
	C1-Q-21 C4-B-45	Another mark printed in green. "PAT. JUNE 26 - 77" located below the same mark as C1-Z-6.	1877-1900
	C1-Q-20	Same mark as C1-Z-6 with the "PAT. JUNE 26 - 77" placed above. In addition, printed in a yellow-green, situated to the right side and at an approximate right angle: "UNION" above "PORCELAIN" above "WORKS" above "GREENPOINT" above "N.Y." within a rectangle with bulging sides. Mark illustrated in Maddock's 1910, Mark 290.	1877-1900

TABLE 10.04 (cont.)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Villeroy & Boch Mettlach, Germany	C2-B-54	Impressed number "2368" above with "04" floating to the right above a printed green mark. An angel head and upper torso holding a nameplate with "VILLEROY & BOCH" above "METTLACH" (bounded by a single line and exterior corona arranged in a semi-circle) above "MADE IN GERMANY" which repeats the semi-circular alignment. Finally, printed in black over the top of the angel wings, the number "10, 3" above "GESCHUTZT". Green angel portion illustrated in Thorn 1957: 37, no. 40.	Nineteenth century
Wood, Son & Co. Cobridge, Staffordshire	C1-JJ-70	Printed. Incomplete, Victorian Royal Arms (standing) above "STONE CHINA" above "WOOD.SON & C^{O}" within a festooned ribbon, above "COBRIDGE". Similar mark illustrated in Godden 1964: 690, Mark 4298.	1869-1879
? ? Austria	C4-30-30	Printed in green. "M.Z." above a schematic crown above a Prussian eagle, that is a double-headed bird shape with outstretched wings while the beaks hold snakes above "AUSTRIA". Also to the right, up-side down and mis-aligned, another mark printed in a lighter green, "MADE I..." above the bird device above "HASBU(RG)" .... (mark incomplete).	?
? France	C4-30-38	Printed in green. "ROYAL" above a crown above a barely legible phrase which may be "IN FRANCE". The words are arranged in a circular fashion, separated by a single dot on each side, with the crown placed within the center.	?

* Also found at N-5.

TABLE 10.05

MAKERS' MARKS AT CHANNEL, CHANNEL PUMP STATION (CP) AND N-5 ALIGNMENTS COMPARED

Manufacturer and Locality	Attributed Dates	Represented at Sites				
		C1	C2	C4	CP	N5
Adams						
Staffordshire	19th century			x		
William Adams						
Tunstall, Staffordshire	1853-1865			x		x
William Adams & Sons						
Tunstall, Staffordshire	1896-1914					x
Henry Alcock & Co.						
Cobridge, Staffordshire	1861-1880					x
	1861-1891	x				
	1891-1900					x
	1891-1910	x				
Richard Alcock						
Burslem, Staffordshire	? - 1885					x
Samuel Alcock & Co.						
Cobridge or Burslem, Staffordshire	September 5, 1854					x
Charles G. Baker						
Burslem, Staffordshire	19th century					x
Bates, Elliot & Co.						
Burslem, Staffordshire	1870-1875					x
T. & R. Boote						
Burslem, Staffordshire	1842-1906	x				x
	September 3, 1853			x		
	August 22, 1856					x
	November 26, 1870				x	
	1890-1906	x	x			x
Brockman Pottery Co.						
Cincinnati, Ohio	1862-1900				x	
Henry Burgess						
Burslem, Staffordshire	1864-1892					x

TABLE 10.05 (con't)

Manufacturer and Locality	Attributed Dates	Represented at Sites				
		C1	C2	C4	CP	N5
Cauldon Potteries Stoke-on-Trent, Staffordshire	1891-1953		x			
E. & C. Challinor Fenton, Staffordshire	1862-1891			x	x	x
Chester Pottery Co. Phoenixville, Pennsylvania	1894--		x			
Edward Clarke Tunstall,	1865-1877					x
	January 1873					x
Longport,	1878-1880					x
	November 1877					x
Burslem, Staffordshire	1880-1887					x
Robert Cochran & Co. Glasgow, Scotland	1846-1918	x		x		x
Creil Montereau, France	?				x	x
Davenport Longport, Staffordshire	1830-1887	x				
Doulton Burslem, Staffordshire	c. 1902		x			
	January 1895-6		x			
James Dudson Hanley, Staffordshire	1838-1888			x		
"E" ? ?	?					x
James Edwards & Son Burslem, Staffordshire	1851-1882					x
John Edwards Fenton, Staffordshire	1847-1900	x			x	
	1880-1900			x		x

TABLE 10.05 (con't)

Manufacturer and Locality	Attributed Dates	Represented at Sites C1	C2	C4	CP	N5
"Excelsior" ?	probably c. Sept. 20, 1880					x
Thomas Furnival & Co. Hanley, Staffordshire	1844-1846	x				
Thomas Furnival & Sons Cobridge, Staffordshire	1871-1890	x				
Glasgow Pottery (John Moses & Sons) Trenton, New Jersey	1863-1890					x
Greenwood Pottery (Stephens & Tams) Trenton, New Jersey	1876-1900			x		x
Charles Field Haviland Limoges, France	c. 1876					x
	c. 1879				x	x
	c. 1880			x		
	1900-1941					x
Hope & Carter Burslem, Staffordshire	1862-1880					x
Thomas Hughes Burslem, Staffordshire	1860-1894	x		x	x	x
J. E. Jeffords & Co. Philadelphia, Pennsylvania	c. 1868-1901		x			x
Johnson Bros. Hanley, Tunstall (1899-1913), Staffordshire	1883-1913			x		
	1883-		x			
George Jones Stoke-on-Trent, Staffordshire	1861-1873					x

TABLE 10.05 (con't)

Manufacturer and LOCALITY	Attributed Dates	Represented at Sites				
		C1	C2	C4	CP	N5
George Jones & Sons						
Stoke-on-Trent,	1873-1891					x
Staffordshire						
Knowles, Taylor & Knowles						
East Liverpool,	1852-1926	x	x			x
Ohio	1870-1926		x			
John Maddock & Sons						
Burslem,	1855-					x
Staffordshire	1880-1896		x			
	1896+		x	x		x
	1906-	x		x	x	x
Maddock & Gater						
?	?					x
Staffordshire						
S. Marchand						
San Francisco,	?			x		
California						
Alfred Meakin						
Tunstall,	1875-1896					x
Staffordshire						
Charles Meakin						
Burslem,	1870-1882					x
Burslem or Hanley,	1870-1889	x		x		x
Staffordshire						
J. & G. Meakin						
Hanley,	1851-	x				x
Staffordshire	c. 1890+					x
Myott, Son & Co.						
Stoke, Cobridge or Hanley,	1898-					x
Staffordshire						
New York City Pottery (Carr & Morrison)	1858-1871			x		
New York City,						
New York						
"Ohio"						
?	?	x				
?						

TABLE 10.05 (con't)

Manufacturer and Locality	Attributed Dates	Represented at Sites C1	C2	C4	CP	N5
Powell & Bishop Hanley, Staffordshire	1867-1878	x		x		x
Powell Bishop & Stonier Hanley, Staffordshire	July 30, 1878			x		
. . .Pritchard Salibury, ?	?	x				
Union Porcelain Works (Thomas C. Smith & Sons) New York City, New York	1876-1900 1877-1900	x x		x x		x
Villeroy & Boch Mettlach, Germany	19th century		x			
Wood, Son & Co. Cobridge, Staffordshire	1869-1879	x				
George Wooliscroft Tunstall, Staffordshire	1851-1853 1860-1864					x

TABLE 10.06

DEVICES OTHER THAN MARKS ON N-5 ALIGNMENT CERAMICS

Manufacturer and Locality	Artifact Number	Description	Attributed Date
	N5-U-434	Small plate of dense earthenware fabric, white; printed in black within an oval on the base, "MAN(FACTURED)". . .above "ACKERMA(N)" . . . (placed horizontally in the center) above "SAN FRANCISCO". Date according to city directories of San Francisco.	1860-1883/4
	N5-M-200 N5-M-547 N5-N-554 N5-U-133 N5-V-154	Small plates of thick ironstone, white; printed in black on the outer rim; "BALDWINS DINING" in a festooned ribbon above "PALACE" within a stylized nameplate. Date according to city directories of San Francisco.	1880-1883/4

TABLE 10.07

PATTERNS ON CERAMICS AT C-2, C-4, CP, and N-5 ALIGNMENTS

	Pattern Name	Artifact Number	Description	Attributed Date
I.	MOULDED PATTERNS			
	Baltic or Dallas	N5-Z-354	Chocolate cup(?). Pattern reportedly made by J. Clementson and T. Hulme (Wetherbee 1974: 10; Hulme illustrated, but appears to be in error, cf. Cushion 1976: 295-306).	c. 1855
	Cable 'N Ring	N5-M-338	Fragment of milk pitcher(?). Pattern made by: John Maddock & Sons c. 1872; Cockson & Chetwynd (registered on either June 16, August 1, or September 3, 1874, in Cushion 1976: 343-344); T. & R. Boote and J. & G. Meakin c. 1890. The most common pattern of the 1870s and 1880s, according to Wetherbee 1974: 47.	c. 1874-1890s
	Corn 'N Oats	N5-Z-353	Handleless cup. Pattern made by Samuel Alcock, Davenport and others according to Wetherbee 1974: 74; See Praetzellis et al. 1979: 32a.	before 1884
	Excelsior	N5-V-9	Shaving mug. Assume Excelsior refers to pattern and not the manufacturer, probably American made.	c. September 20, 1880
	Face	N5-N-720	Fragment of rounded vessel.	
		N5-N-727	Fragment of square-shaped vessel. Vessel made by J. & G. Meakin as indicated by printed mark.	1851-
		N5-U-580	Oval lid. Pattern also present in Old Sacramento sample (Mary Praetzellis, personal communication).	

TABLE 10.07 (con't)

Pattern Name	Artifact Number	Description	Attributed Date
Fig	N5-P-138	Fragment of ewer. Pattern made by Samuel Alcock between 1830 and 1859; registered by Davenport November 14th, 1856 and April 12th, 1861; also produced by J. Wedge Wood in 1856. Date according to Praetzellis et al. 1979b: fig. 40, 399. See also Wetherbee 1974: 72-73.	1830-1859; 1956; 1861
Simplified Fig	N5-U-578 N5-U-579	Enlongated oval lid. Oval lid. Less elaborate version than "fig" pattern, cf. Praetzellis et al. 1979b: 33c and 44b.	?
Senate	CP-13	Base fragment of unknown shape. Vessel made by and registered by T. & Boote as indicated by impressed mark. Pattern illustrated in Wetherbee 1974: 37.	November 26, 1870
Sydenham	C4-B-62	Tureen base fragment(?) Vessel made by T. & R. Boote as indicated by impressed mark. Pattern also made by J. Clementson (1839-1864 by Godden 1964: 150) and Edward Corn (1853-1864 by Praetzellis 1979: 14), according to Wetherbee 1974: 8-9, 91.	September 3, 1853
Union	N5-M-40	Round lid, knob missing. Vessel made by and registered by T. & R. Boote as indicated by impressed mark	August 22, 1856
II. PRINTED PATTERNS			
Nurfolk	C2-B-36	Tea cup base fragment. Printed registration number 251612 (Godden 1964: 527) by Doulton.	between January 1895 and 1896.
Mikado	C4-M-43	Bowl base fragment. Date according to Godden 1964: 355 for Johnson Brothers.	1883--

TABLE 10.08

MAKERS' MARKS AT SOUTHEAST SITE

Manufacturer and Locality	Artifact Number	Description	Attributed Date
Acme China ?	SE-L-2	Printed in green. "DOLORES" above "ACME CHINA": above a crown.	?
Bauscher Brothers New York and Weiden, Germany	FQ1-C-273	Printed in blue. "PATENT APPLIED FOR" above "ESPECIALLY MADE FOR" above "PALACE HOTEL, SAN FRANCISCO" above "BAUSCHER BROS". above "NEW YORK & WEIDEN" above "GERMANY'. Bauscher Brothers has been in business since 1881 (Bauscher 1956); the Palace Hotel opened in 1875.	1881-1956+
Bryant probably United States	FQ2-B-35	Impressed. "66UW 6UUV" above "BRYANT". See also Praetzellis et al. 1979a Table 1.	?
Henry Brunt East Liverpool, Ohio	FQ2-A-9	Impressed, "BRUNT". Ramsay 1947: 215; conflicts with Barber 1904: 107 as William Brunt, Son & Co. c. 1850 and later as William Brunt Pottery Co. in 1894.	c. 1856-1895
Buffalo China Buffalo, New York	SE-R-48	Printed in green. "BUFFALO CHINA" above "1926".	1926
	SE-A-105	Printed in green "BUFFALO" above "CHINA" above "1927'.	1927
	SE-P-10 SE-R-8	Printed in black. "MADE SPECIAL" above "FOR" above "PALACE HOTEL" above "FURNISHED BY" above "DOHRMANN HOTEL SUPPLY CO." above "BUFFALO" above "CHINA". Date according to Altman 1969: 19, 28; Ketchum 1971: 128. Dohrmann Hotel Supply Company has been in business from 1851 and stopped printing the company name about fifty years ago (personal communication).	1901-1956

TABLE 10.08 (con't)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Crestia ?	SE-BB-30	Printed in green. "CRESTIA" above "HOTEL" above "CHINA" arranged within a circle.	?
Dresden Pottery (Brunt, Bloor, Martin & Co.) East Liverpool, Ohio	SE-L-16	Printed in green. "Dresden" above "Hotel China" above "WARRANTED". Produced by Brunt, Bloor, Martin & Company from 1875 to 1892 and mark used by the Potter's Co-Operative Co. from 1892 to 1900 (Ramsay 1947: 218).	1875-1900
Globe Pottery (Grindley Hotel Ware Co. Ltd.) Tunstall, Staffordshire	SE-O-89	Printed in green. "GRINDLEY" above "ENDLY" above "Hotel ware". Date according to Godden 1964: 293.	1908+
W. H. Grindley & Co. Tunstall, Staffordshire	FQ1-C-260	Printed in green. "Grindley Hot" above "England Vitrified". Possibly W. H. Grindley & Co. according to Praetzellis 1979: 23; see also Godden 1964: 294.	c. 1880-1891
Frederick & Nelson ?	SE-U-43	Printed in green. "FREDERICK & NELSON". On a vessel with "WHITE LUNCH" restaurant logo which is found in city directories of San Francisco between 1913 and 1930. Frederick and Nelson is more likely a jobber of ceramics and not the manufacturer.	1913-1930
?	SE-L-13	Printed. "GERMANY".	?
?	FQ1-C-208	Printed in green. "GERMANY" in a circle.	
Germany	SE-O-17	Printed in green. "GERMANY" within a circle with a small dot placed in the center.	
	FQ7-A-90 SE-M-27	Printed in green. "MADE IN GERMANY" placed within two concentric circles.	
	SE-BB-124	Printed in green. "BURLEY & CO" above "CHICAGO" above "MADE IN GERMANY" above "COLORS UNDERGLAZE".	?

TABLE 10.08 (con't)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
Hall ?	FQ1-C-223	Impressed. "HALL".	?
Charles Field Haviland Limoges, France	FQ1-C-225	Printed in red. "HAVILAND & Co" above "LIMOGES". Mark illustrated in Kovel 1953: 61b.	c. 1889
	SE-O-60	Printed in green script lettering "GDA" above a horizontal line above "FRANCE" and printed in red "CH(ARLES) FIELD HAVILAND LIMOGES" arranged within two concentric circles. Green mark illustrated Thorn 1947: 7, no. 32. Red mark illustrated Thorn 1947: 6, no. 28.	late 19th century
? Limoge, France	FQ4-K-98	Printed in green. "LIMOGE FRANCE".	?
Knowles, Taylor & Knowles East Liverpool, Ohio	FQ2-B-48	Printed. "K.T.&K." above "CHINA" above "2".	1852-1926
	SE-N-64	Printed in green. "K.T.& K." above a horizontal line, above "S" above another horizontal line, above "CHINA".	
	FQ2-B-32	Printed. "K.T. & K." above "S-V" above "CHINA" above an impressed "4111". All numbers probably refer to style number. Date according to Ketchum 1971: 184.	
Lovatt and Lovatt Langley Mill, Nottingham	SE-O-56	Impressed. "CUP" (misaligned) above "LOVATT" above "LANGLEYMILL" above "ENGLAND" above "S" (again a misalignment with the name and place of manufacture). Date according to Godden 1964: 398.	1895-
	SE-U-37	Impressed. "LEADLESS" above "GLAZE" above "CUP" (placed to the right and misaligned), above "LOVATT" (to the left side), above "VIT(RIFIED). . ."	

TABLE 10.08 (con't)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
John Maddock & Sons Burslem, Staffordshire	SE-W-14	Printed in green. A lion, above "VITRIFIED" above "JOHN MADDOCK & SONS" above "ENGLAND" above "ALTHEA". Althea probably refers to the pattern name. Mark extremely similar to Godden 1964: 406, Mark 2465.	c. 1896+
	SE-W-6	Printed in green. A lion above "VITRIFIED" above "JOHN MADDOCK & SONS" above "ENGLAND" above "NATHAN DOHRMANNCO". above "SAN FRANCISCO" above an impressed "IV." Secured for Tait's Restaurants which was in business 1907, 1920-1931 (city directories of San Francisco). Mark extremely similar to Godden 1964: 406, Mark 2465.	c. 1896+
	SE-L-79	Printed in green. "MADDOCK" above "ENGLAND" arranged around two concentric circles. Possibly John Maddock & Sons (Praetzellis 1979: 29).	probably 1906+
	SE-BB-119	Printed in blue. "(VI)TRIE(D)" above "(MAD)DOCK & SONS LTD." above "(EN)GLAND" above ". . .SON.". Date according to Godden 1964: 406.	1896+
? ?	FQ7-A-91	Printed in green. "FRANUNFLECHTER" above "OHIO" within a center diamond, above "CHINA" located within two concentric ovals above "80" (centered beneath the ovals).	?
Onondaga Pottery Co. (Syracuse China Corporation) Syracuse, New York	SE-O-25	Printed in green. "O.P.C.O." above "SYRACUSE" above "CHINA" above "2-G". The "2-G" is probably a model or type classification. Date according to Ketchum 1971: 180; see also Maddock's 1910: 208, mark 296.	1871+
	FQ2-B-70	Printed in green. "O.P.C.P." above "SYRACUSE" above "CHINA". All letters are equally spaced.	

TABLE 10.08 (con't)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
	FQ2-C-157	Mark incomplete. "SYRAC. . .CHINA".	
? Silesia, Germany	FQ4-E-70	Printed in red. "OLD IVORY XXII" above crown and crest (latter in blue) above "Silesia".	?
	FQ1-C-271	Printed in green. "P & K" above a crown (questionable) above "SILESIA".	?
Ridgways Hanley, Staffordshire	SE-Q-6	Printed in blue-green. A crown above "RIDGWAYS" above "VITRIFIED" which is placed within the interior of a rayed circle, above "ENGLAND" (below this circle in the outer circle with Ridgways), above "CAMBRIDGE" above "S. STERNHEIM & SON" above "SAN FRANCISCO". Mark employed after 1891 (Godden 1964: 539 and Kovel 1953: 203d). S. Sternheim & Son was in business between 1900 and 1908 (city directories of San Francisco).	1900-1908
	SE-Q-69	Printed in green. A crown, above "RIDGWAYS" above "VITRIFIED" placed in the interior of a rayed circle, above "ENGLAND" (placed in an outer circle along with Ridgways); above "HOTEL DEPARTMENT" above "CHAS. BROWN & SONS." above "SAN FRANCISCO". In comparison to SE-Q-6 there are subtle differences not only in the jobbers name, but also in the base of the crown and the color difference. Charles Brown & Sons continued in business between 1907 and 1951+.	1907-1952
? ?	FQ3-E-56	Printed in blue. "STONE & . . ." above "T.D.".	?

TABLE 10.08 (con't)

Manufacturer and Locality	Artifact Number	Mark Description	Attributed Date
? ? United States	SE-Q-80	Printed in blue. "TEPCO" above "U.S.A. CHINA".	?
? ? Holland	SE-BB-58	Printed in blue. "TETRUS REG. . ." above "MAASTRICHT ", within a rectangle, above "ORIENTAL" above "MADE IN HOLLAND".	?
W. G. & Co. Limoges, France	SE-W-5	Printed in green. "LIMOGES" above "W" above "G" above "& CO" (insdie of curvilinear brackets), above "FRANCE" above "BURLEY & TYRELL CO." above "FOR THE SEWART HOTEL CO.". For the central portion of the mark see Thorn 1947: 6, no. 26. (The Stewart Hotel appears in city directories of San Francisco between 1892-1906, 1907-1951+)	1892-1906 1907-1951+
Wood & Sons Burslem, Staffordshire	FQ3-E-67	Printed in green. "(VIT)RIFIED ACOME CHINA" above "WOOD & SONS" above "ENGLAND" above "FURNISHED BY A(LBER)T PICK & CO. CHICAGO, IL.". The change from Son to Sons within Wood & Co. occured about 1907 (Godden 1964: 689).	1907+
? Indianapolis, Indiana	FQ1-C-210	Impressed. "U.S.E.T.W." above "INDIANAPOLIS".	

TABLE 10.09
DEVICES OTHER THAN MARKS ON SOUTHEAST SITE CERAMICS

Manufacturer and Locality	Artifact Number	Description	Attributed Date
?	SE-M-8	Bottle cap which resembles the shape of metal crown cap type. Printed in black: "USE" above "BARTLETT" above "WATER". Date according to city directories of San Francisco.	1889-1936
?	SE-P-13	Plate fragment, heavy ware type, with red and green stripe with "Compton's" above "The food of Quality" placed on the rim. Date according to city directories of San Francisco.	1929-
	SE-0-73	Pot lid printed in black "FOR BEAUTIFYING AND PRESERVING THE TEETH & GUMS" above "PREPARED BY JOHN GOSNELL & CO LONDON" along with "CHERRY TOOTH PASTE" above "PATRONIZED BY THE QUEEN" placed in an outer concentric circle. Illustrated in Clark 1955: 286. Date according to Clark 1955: 285; Praetzellis et al. 1979b: fig. 25d.	1837-1901
	SE-N-22	Jar fragment, cream colored earthenware. Printed in black "Dundee Marmalade" and incomplete.	
Wood & Sons, Burslem, Staffordshire	FQ1-B-103	Ceramic plate fragment, white ground with two green bands and "Pig N' Whistle" placed in the center. See Wood & Sons for description of mark. Date according to city directories of San Francisco.	1911-1951+
?	SE-BB-59	Plate fragment with "St. Francis" printed in script on the rim. The hotel opened in 1904 (Jackie Harrison, Personal communication).	1904-

TABLE 10.09 (cont.)

Manufacturer and Locality	Artifact Number	Description	Attributed Date
John Maddock & Sons Burslem, Staffordshire	SE-W-6	Plate with the name "Tait's" printed in green script style on the rim. See John Maddock & Sons for description of mark. Date according to city directories of San Francisco.	1907; 1920-1931
?	SE-0-31	Plate with green and red encircling lines about the rim a space and another red line. Printed on the interior border with "Woolworth's". Woolworth merged with E. P. Charlton in late April of 1911. The use of this white ware probably ended prior to 1946.	1911-1946
?	SE-U-43	Cup, heavy ware type with green and red encircling lines placed below the rim. "WHITE LUNCH" printed on one side of the mug with a circle containing a student lecture chair sitting in front of a brick wall. "Z.W. WHITE" printed beneath the outer rim of the circle. See Frederick & Nelson for the extent of the mark description. Date according to city directories of San Francisco.	1913-1930

TABLE 10.10

SOUTHEAST SITE CERAMICS: JOBBERS NAMES, MANUFACTURER, AND CUSTOMERS

Jobber Name, Location, and Date	Manufacturer, Locality, and Date	Customer, Locality, and Date	Artifact Number
Bauscher Brothers New York and Weiden, Germany 1881-1956+	Bauscher brothers New York and Weiden, Germany 1881-1956+	Palace Hotel San Francisco, California 1875+	FQ1-C-273
Charles Brown & Sons San Francisco, California 1907-1951+	Ridgways Hanley, Staffordshire 1879-1952	?	SE-Q-69
Burley & Co. Chicago, Illinois ?	? "Made in Germany" ?	?	SE-BB-214
Burley & Tyrell Co. possibly Chicago, Illinois ?	? Limoges, France	The Stewart Hotel Co. San Francisco, California 1892-1905/1906 1907-1951+	SE-W-5
Nathan Dohrmann Co. San Francisco, California 1851-1930	John Maddock & Sons Burslem, Staffordshire c. 1896+	Tait's Restaurants, San Francisco, California 1907; 1920-1931	SE-W-6

TABLE 10.10 (con't)

Jobber Name, Location, and Date	Manufacturer, Locality, and Date	Customer, Locality, and Date	Artifact Number
Dohrmann Hotel Supply Co. San Francisco, California 1851-1930	Buffalo China ? ? c. 1885-1927+	Palace Hotel San Francisco, California 1875+	SE-P-10 SE-R-8
Frederick & Nelson ? ? ?	? Restaurants	"White Lunch"/Z. W. White San Francisco, California, 1913-1930	SE-U-43
S. Sternheim & Son San Francisco, California 1900-1908	Ridgways Hanley, Staffordshire 1879-1952	?	
Albert Pick Co. Chicao, Illinois ?	Wood Sons & Co. Burslem, Staffordshire 1907+	?	FQ3-E-67
Albert Pick Co. Chicago and San Francisco, California	Wood Sons & Co. Burslem, Staffordshire 1907+	Pigs N'Whistle Restaurants San Francisco, California 1911-1951+	FQ1-B-103

TABLE 10.11 - TABLE 10.12

KEY TO SITES

CODE	SITE	REFERENCE
FV	Fort Vancouver	Ross 1972
FH	Fort Humbolt	Jewell 1966
FR	Fort Ross	Barclay 1976
WS	Warm Springs	Greenwood et al. 1979
SR	Santa Rosa	Praetzellis and Praetzellis 1979c
SB	Sonoma Barracks	Praetzellis and Praetzellis 1976
S'F	Sutter's Fort	Broadbent 1961
OS	Old Sacramento	Pritchard 1972; Praetzellis and Praetzellis 1979b; Praetzellis 1979
F	Farallones	Pilling 1952
SE	Southeast (San Francisco)	Tables 10.08, 10.09, and 10.10
SJ	San Jose	Cartier et al. 1979
V	Ventura	Benté 1976a; Schemmer 1976
I	Irvine	Chace 1969
L	Lovelock, Nevada	Praetzellis and Praetzellis 1979a

TABLE 10.11

MAKERS OF C-1, C-2, C-4, CP, AND N-5 ALIGNMENT CERAMICS COMPARED TO OTHER SITES

Manufacturer and Locality	Attributed Date	Represented at Sites													
		FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Adams ?, Staffordshire	19th century								x						
William Adams Tunstall, Staffordshire	1853-1865								x			x			
William Adams & Sons Tunstall, Staffordshire	1896-1914	x			x				x				x		
Henry Alcock & Co. Cobridge, Staffordshire	1861-1910				x	x			x				x		
Richard Alcock Burslem, Staffordshire	?-1885				x				x			x			
Samuel Alcock & Co. Cobridge or Burslem, Staffordshire	1828-1859								x						
Charles G. Baker Burslem, Staffordshire	19th century														
Bates, Elliot & Co. Burslem, Staffordshire	1870-1875														
T. & R. Boote Burslem, Staffordshire	1842-1906		x		x	x		x	x	x[1]			x		
Brockman Pottery Co. Cincinnati, Ohio	1862-1900														
Henry Burgess Burslem, Staffordshire	1864-1892			x	x				x	x[2]			x		

TABLE 10.11 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Cauldon Potteries Stoke-on-Trent, Staffordshire	1891-1953														
E. & C. Challinor Fenton, Staffordshire	1862-1891			x		x			x	x		x	x		
Chester Pottery Co. Phoenixville, Pennsylvania	1894-?														
Edward Clarke Tunstall; Longport; Burslem, Staffordshire	1865-1887				x	x[3]			x			x	x		
Robert Cochran & Co. Glasgow, Scotland	1846-1918	x							x			x	x		x
Creil Montereau, France	?														
Davenport Longport, Staffordshire	1830-1887	x			x	x		x	x			x	x		
Doulton Burslem, Staffordshire	1882-?														
James Dudson Hanley, Staffordshire	1838-1888														
"E" ?	?														
James Edwards & Son Burslem, Staffordshire	1851-1882					x			x	x			x		
John Edwards Fenton, Staffordshire	1847-1900			x			x		x			x			

TABLE 10.11 (con't)

Manufacturer and	Attributed	Represented at Sites													
Locality	Date	FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
"Excelsior" ?	c.Sept. 20, 1980 (?)														
Thomas Furnival & Co. Hanley, Staffordshire	1844-1846														
Thomas Furnival & Sons Cobridge, Staffordshire	1871-1890	x		x	x				x				x		x
Glasgow Pottery (John Moses & Sons) Trenton, New Jersey	1863-1890														
Greenwood Pottery (Stephens & Tams) Trenton, New Jersey	1876-1900				x								x		x
Charles Field Haviland Limoges, France	c. 1876-1941										x				
Hope & Carter Burslem, Staffordshire	1862-1880							x	x						
Thomas Hughes Burslem, Staffordshire	1860-1894	x		x	x			x	x			x	x		x
J. E. Jeffords & Co. Philadelphia, Pennsylvania	c. 1868-1901			x											
Johnson Bros. Hanley; Tunstall, Staffordshire	1883-?			x	x		x								x
George Jones Stoke-on-Trent, Staffordshire	1861-1873				x										
George Jones & Sons Stoke-on-Trent, Staffordshire	1873-1891								x						

TABLE 10.11 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Knowles, Taylor & Knowles East Liverpool, Ohio	1852-1926				x						x	x	x		x
John Maddock & Sons Burslem, Staffordshire	1855-?	x		x	x				x		x	x	x[4]		x
Maddock & Gater ?, Staffordshire	?												x		
S. Marchand San Francisco, California	?														
Alfred Meakin Tunstall, Staffordshire	1875-1896				x								x		
Charles Meakin Burslem or Hanley, Staffordshire	1870-1889			x	x			x	x			x			x
J. & G. Meakin Hanley, Staffordshire	1851-?			x	x			x	x				x		x
Myott, Son & Co. Stoke, Cobridge or Hanley, Staffordshire	1898-														
New York City Pottery (Carr & Morrison) New York City, New York	1858-1871						x[5]								
"Ohio" ?	?														
Powell & Bishop Hanley, Staffordshire	1867-1878		x		x		x	x	x			x			

TABLE 10.11 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites													
		FV	FH	FR	WS	SR	SB	S'F	OS	F	SE	SJ	V	I	L
Powell, Bishop & Stonier Hanley, Staffordshire	1878-1891														
. . .Pritchard Salisbury, ?	?														
Union Porcelain Works (Thomas C. Smith & Sons) New York City, New York	1876-1900														
Villery & Bock Mettlach, Germany	19th century														
Wood, Son & Co. Cobridge, Staffordshire	1869-1879														
George Wooliscroft Tunstall, Staffordshire	1851-1853 1860-1864								x				x		

NOTES TO TABLE 10.11:

1. T. R. Boote, Walley & Jones according to Cushion 1976: 290.
2. Possibly Henry Burgess (Mary Praetzellis, personal communication).
3. Alternatively Bridgwood & Clarke.
4. Subsumes Maddock & Co., 1906+ and Maddock 1842-1855 (Godden 1964: 406-407).
5. Possibly New York City Pottery.

* The intervals of dates associated with specific marks have been combined. The written sources supply varying time periods, and thus the dates attributed to ceramics found in the Channel alignments and the N-5 dump vary accordingly.

TABLE 10.12

MAKERS OF CERAMICS RECOVERED FROM SITES IN THE WESTERN U.S. NOT FOUND AT C-1, C-2, C-4, CP, and N-5 ALIGNMENTS

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Acme China ?	?										x				
William Adams & Co.	1879-?					x			x						
Tunstall, Staffordshire	January 21, 1883											x			
William & Thomas Adams Tunstall, Staffordshire	1866-1892								x						
John Alcock Cobridge, Staffordshire	1853-1861								x				x		
B. F. & J. ?, England	1891-?														x
William Baker & Co. Fenton, Staffordshire	1839-1932					x			x						
Barrow & Co. Fenton, Staffordshire	August 27, 1855								x						
Bauscher Brothers New York & Weiden, Germany	1881-1956+										x				
J. M. P. Bell & Co.	1842-1928								x					x	
Glasgow, Scotland	1850-1870												x		
Joseph Bourne & Son Ltd. Denby, Derbyshire	c. 1850-1860	x				x									
George Frederick Bowers Tunstall, Staffordshire	1842-1868								x						
Bridgwood & Clarke Burslem, Staffordshire	1857-1864								x				x		

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Henry Brunt East Liverpool, Ohio	c. 1856-1895										x				
Bryant probably United States	1891														x
Buffalo China[1] Buffalo, New York	1901-1956				x						x				
	1926										x				
	1927										x				
Burford Bros. Pottery Co. East Liverpool, Ohio	1879-1900														x
Burgess & Goddard ?	?							x			x				
C. P. & Co. (possibly Chittenango Pottery) New York City, New York	(1897-?)														x
E. Challinor & Co. Fenton, Staffordshire	1853-1862								x				x	x	
Clementson Brothers Hanley, Staffordshire	1867-1880														x
Joseph Clemenston Hanley, Staffordshire	1839-1864								x				x		
Close & Co. Stoke-on-Trent, Staffordshire	1855-1864								x						
J. T. Close & Co. Stoke-on-Trent, Staffordshire	January 3, 1866								x						

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	S'F	OS	F	SE	SJ	V	I	L
Cockson & Chetwynd[2] Cobridge, Staffordshire	1867-1877					x	x								
Cockson & Seddon Cobridge, Staffordshire	1875-1877				x										
Coors Porcelain Co. Golden, Colorado	1925-?														x
Copeland & Garret Stoke-on-Trent, Staffordshire	1833-1847	x							x						
W. T. Copeland (Copeland, Late Spode) Stoke-on-Trent, Staffordshire	1847-1867	x					x			x					
Cork, Edge & Malkin Burslem, Staffordshire	1860-1871								x						
Edward Corn Burslem, Staffordshire	1853-1864								x						
Crestia ?	?										x				
Thomas Dimmock & Co. Shelton, Hanley, Staffordshire	May 7, 1844								x						
Dresden Hotel China[3] (Brunt, Bloor, Martin & Co.) East Liverpool, Ohio	1875-1900				x						x				
E. T. P. & Co. ?	?											x			

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
James Edwards Burslem, Staffordshire	1842-1851								x						
Elsmore & Forster Tunstall, Staffordshire	1853-1871								x						
Oliver Evans 61 South 2nd St., U.S.	?								x						
J. F. (possibly Jacob Furnival & Co.) (Cobridge, Staffordshire)	c. 1845-1870								x			x			
E. A. & S. R. Filley^{4} St. Louis, Missouri	September 3, 1851							x							
Henri Fouque St. Gaudens, France	?								x						
Frederick & Nelson^{5} ?	1913-1930										x				
"Furnival" Staffordshire	mid-19th century								x						
Jacob Furnival Cobridge, Staffordshire	1845-1870												x		
G. E. Co. ?, United States	September 1, 1891														x
J. Genella^{6} San Francisco, California	1858-? prior to 1880								x						
Thomas Goodfellow Tunstall, Staffordshire	1828-1859								x				x		

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Repesented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Goodwin Brothers East Liverpool, Ohio	c. 1876-1893 (?)								x						x
"Goodwin & Co." ?	?								x	x					
J. Goodwin Seacombe, Liverpool	1852-1871								x						
Grindley Hotel Ware Co. Tunstall, Staffordshire	1908-?										x				
W. H. Grindley & Co. Tunstall, Staffordshire	1880-1891										x				
	1891-1925								x						x
	1891+												x		
Hall ?	?										x				
Hammersley & Co.[7] Longton, Staffordshire	1887-1932								x						
C. & W. K. Harvey Longport, Staffordshire	1835-1853								x						
Hicks, Meigh & Johnson Shelton, Staffordshire	1822-1835	x													
Holland & Green Longton, Staffordshire	1853-1882								x						
John, King, Knight Fenton, Staffordshire	July 11, 1846								x						
Johnston & Co. Bordeaux, France	post-1834						x								

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Edwin M. Knowles ?, Ohio	1901-?				x										
Kokus China ?	?														
Homer Laughlin	1872-?									x					
East Liverpool, Ohio	1879-1897						x		x						
Lovatt & Lovatt Langley Mill, Nottingham	1895-?										x				
Lyman, Fenton & Co. Bennington, Vermont	1849-1858								x						
Maddock & Co.[8] Burslem, Staffordshire	1906+				x							x			
John Maddock Burslem, Staffordshire	1842-1855	x							x						
"Masons" (Charles James Mason or Francis Morley) Staffordshire	1845-1862								x						
J. Mayer	1847[9]												x		
?, Staffordshire	1879[10]													x	
T. J. & J. Mayer	1843-1855	x					x						x		
Longport, Staffordshire	September 2, 1851							x							
Mayer & Elliot Longport, Staffordshire	1858-1861								x						
Meakin ?, Staffordshire	19th century												x	x	

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
C. A. Meakin[11] ?	?												x		
Charles Meigh Hanley, Staffordshire	1835-1849							x	x						
Charles Meigh & Son Hanley, Staffordshire	1851-1861	x							x						
Mellor, Taylor & Co. Burslem, Staffordshire	1880-1904											x			
Mellor, Venables & Co. Burslem, Staffordshire	1834-1851								x				x		
Mercer Pottery Co.[12] Trenton, New Jersey	1869-1900				x										
"Michigan Bar" (possibly J. W. Orr & Co.) Michigan Bar, California	1859-1896								x						
James Mist London, England	1810-1815	x													
Moore Brothers Longton, Staffordshire	1872-1905												x		
New Wharf Pottery Burslem, Staffordshire	1900-1901												x		
D. E. Nichol Pottery Co.[13] East Liverpool, Ohio	1892-1900				x										
Old Hall Earthenware Co. Ltd. Hanley, Staffordshire	1861-1886								x						

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Onondaga Pottery Co. (Syracuse China Corp.) Syracuse, New York	1871-1900										x				
PEXON ?	?				x										
PMP ?	?				x										
P & K Silesia, Poland	?										x				
Pacific Pottery Sacramento, California	c. 1880-1890								x						
J. W. Pankhurst & Co. Hanley, Staffordshire	1850-1882												x		
Pinder, Bourne & Co. Burslem, Staffordshire	1862-1882								x						
Pinder, Bourne & Hope Burslem, Staffordshire	1851-1862								x						
Podmore, Walker & Co. Tunstall, Staffordshire	1834-1859								x				x		
Alesksei Gavrilovich Popov Gorbunovo, Dimitrov, Russia	1811-1850			x											
Potters Cooperative Co.[14] ?, United States	1920-1926												x	x	
Pratt & Simpson (?) Fenton, Staffordshire	1878-1883				x										

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites													
		FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
Raeone Brothers ?	?								x						
Ridgway, William Hanley, Staffordshire	1830-1854								x						
Ridgways Hanley, Staffordshire	1900-1908 1907-1952										x x				
E. Roch. . . possibly the United States	?								x						
S. H. & Co. (possibly Sampson Handock) Tunstall, Stoke, Staffordshire	c. 19th century (1858-1890)								x						
Schiller & Gerbring Bodenbach, Bohemia, Germany	1828-?								x						
Sebring Pottery Co.[15] East Liverpool, Ohio	1887-1900				x										
Sharpe (possibly Sharpe Bros. & Co.) Burton-Upon-Trent, Derbyshire	c. 1821-1895								x						
Shenango China New Castle, Pennsylvania	1910-?				x										
Anthony Shaw Burslem, Staffordshire	1860-1900				x										
Josiah Spode Stoke-on-Trent, Staffordshire	c. 1784-1833	x													

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	Represented at Sites													
		FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
W. G. & Co.[17] Limoges, France	1892-1951+										x				
W. R. (possibly William Ridgway) Hanley, Staffordshire	1830-1834												x		
J. W. & Son ?	?														x
Thomas Walker Tunstall, Staffordshire	1845-1851								x				x		
Wallace & Chetwynd[18] East Liverpool, Ohio	1881-1900											x			
Edward Walley Cobridge, Staffordshire	1845-1856								x						
John Wedge Wood Burslem; Tunstall, Staffordshire	1841-1860	x						x	x						
The West End Pottery Co. East Liverpool, Ohio	1920-1921												x		
C. Whalley[19] Sacramento, California	1849-1853								x						
Wheeling Pottery Wheeling, West Virginia	1886-1896												x		
Arthur J. Wilkinson Burslem, Staffordshire	1885-1896						x		x						x
Wood & Sons Burslem, Staffordshire	1907+										x				
Z. S. & Co. ?	?	x													x

TABLE 10.12 (con't)

Manufacturer and Locality	Attributed Date	FV	FH	FR	WS	SR	SB	SF	OS	F	SE	SJ	V	I	L
W. G. & Co.[17] Limoges, France	1892-1951+										x				
W. R. (possibly William Ridgway) Hanley, Staffordshire	1830-1834												x		
J. W. & Son ?	?														x
Thomas Walker Tunstall, Staffordshire	1845-1851								x				x		
Wallace & Chetwynd[18] East Liverpool, Ohio	1881-1900											x			
Edward Walley Cobridge, Staffordshire	1845-1856								x						
John Wedge Wood Burslem; Tunstall, Staffordshire	1841-1860	x						x	x						
The West End Pottery Co. East Liverpool, Ohio	1920-1921												x		
C. Whalley[19] Sacramento, California	1849-1853								x						
Wheeling Pottery Wheeling, West Virginia	1886-1896												x		
Arthur J. Wilkinson Burslem, Staffordshire	1885-1896						x		x						x
Wood & Sons Burslem, Staffordshire	1907+										x				
Z. S. & Co. ?	?	x													x

NOTES TO TABLE 10.12

1. Buffalo China: date from Altman et al. 1969: 19, 28; 1905--in Greenwood et al. 1979: 110.
2. Cockson & Chetwynd: alternatively Cockson & Seddon at Sonoma Barrack's, according to Praetzellis 1976: 15.
3. Dresden Hotel China: date from 1875-1892 by Ramsay 1947: 218; 1876--in Greenwood et al. 1979: 110.
4. E. A. & S. R. Filley: printed on a T. J. & J. Mayer vessel, probably a jobber (Broadbent 1961; correction of initials by Praetzellis 1980, personal communication).
5. Frederick & Nelson: date based on listing in city directories for the commercial establishment (Table 10.10); this mark may represent either a jobber or manufacturer.
6. J. Genella: the mark of an importer (Praetzellis 1979: 22).
7. Hammersley & Co.: description provided by Praetzellis 1979: 24 is equivalent to Haviland mark in the San Francisco sample (Table 10.02; Kovel 1969: 60).
8. Maddock & Co.: this mark appears to be one of the marks subsumed under the John Maddock & Sons discussion in the N-5 and C-Fill tables (Godden 1964: 406-407; Tables 10.02 and 10.04).
9. J. Mayer: registry mark in Benté 1976a: 324 does not agree with Cushion 1976: 292-293, for which only T. J. & J. Mayer registered marks.
10. J. Mayer: the attributed date for either John or Joseph Mayer does not agree with Godden 1964: 423.
11. C. A. Meakin appears to be a typographical error or Godden 1964: 425-426 includes only Alfred or Charles.
12. Mercer Pottery Co.: date from Ramsay 1947: 183, as 1868-? in Greenwood et al. 1979: 110.
13. D. E. Nichol Pottery Co.: located in West Virginia according to Greenwood et al. 1979: 110; date from Ramsay 1947: 217.
14. Potter's Cooperative Co.: as Potter's Co-Operative Col, East Liverpool, Ohio, 1892-1900 in Ramsay 1947: 218.
15. Sebring Pottery Co.: date from Ramsay 1947: 218; as 1887-? in Greenwood et al. 1979: 110.
16. Trenton China Co.: alternative date of 1865-1872 in Ramsay 1947: 181.
17. W. G. & Co.: date based on listing in city directories for the commercial establishment (Table 10.08).
18. Wallace & Chetwynd: date and location according to Ramsay 1947: 219.
19. C. Whalley: the mark of an importer (Praetzellis 1979: 42).

TABLE 10.13

PRINTED POT LIDS AT N-5 ALIGNMENT

Manufacturer and Locality	Artifact Number	Description	Attributed Date
?	N5-N-127 N5-O-18	Printed in black. An elaborate shield device with fruits and wing and cross-like top with "COLD CREAM" (fancy script style) placed in the center. 2 and 13/16 inches in diameter.	?
John Gosnell & Co. London, England	N5-M-489 N5-T-39	Printed in black. Bronze Medallion (Clark 1955: 286) placed within the center; N5-M-489 flanked with "Extra Moist" on either side of the profile; Within the inner circle: "FOR BEAU(FIFYING AND PRE)SERVING THE TEETH & GUMS"; above "PREPARED BY JOHN GOSNELL & CO LONDON"; outer concentric circle with "CH(ERRY TOO)TH PASTE" above 3 and 2+/16 inches in diameter.	1837-1901
	N5-U-97 N5-U-213	Printed with black over green to yellow ground, overglaze line in gold gilding encircling the periphry; otherwise equivalent to N5-M-489. 3 and 2+/16 inches in diameter; Date according to Clarke 1955: 285; Praetzellis et al. 1979b: fig. 25d.	1846-1901
Docteur Pierre ?	N5-M-490 N5-M-491	Printed in black. Shield device with a lion holding the letters "D" and "P" within the center; "POUDRE" above "DENTIFRICE" above "DU" above "DOCTEUR PIERRE" above "(?) de Medicine" in a combination of script and block lettering (mark incomplete). 2 and 3/4 inches in diameter.	?

TABLE 10.14

PRINTED POT LIDS AT C-1 and C-2 ALIGNMENTS

Manufacturer and Locality	Artifact Number	Description	Attributed Date
Xavier Bazin Philadelphia, Pennsylvania	C1-G-6	Printed in dark pink. An outer ring of a large scale floral motif; interior "BAZI(N'S) above "UNRIV(LED)" above "PRE(MIUM)" above "SHAVIN(G CREAM)" above "Gold & Silv(er Medals awarded)" above "By the (Inst(utite of New York)" above "PHIL(ADELPHIA & BOSTON)" above "X". ("Bazin" above "Perfumer") above "PHIL(ADELPHIA)" (Barbara Jackson, personal communication). 3 and 1/2 inches in diameter.	c. 1850s-1887
Lyman's Montreal, Canada	C2-F-3	Printed in blue. A single cherry with stem and leaves within the interior with an outer encircling rim with "LYMAN'S" with "EFFECTUALLY CLEANSES" (sic) above "THE TEETH & GUMS" on the left; with "IMPARTS A DELIGHTFUL" above "FRAGRANCE TO THE BREATH"; "MONTREAL" below placed horizontally on left; "CANADA" placed horizontally below on right; above "CHERRY TOOTHPASTE". 3 and 1/8 inches in diameter.	?
John Gosnell & Co. London, England	C1-S-12 C1-JJ-44	Printed with black over green to yellow ground, overglaze line in gold gilding encircling the periphery. Bronze Medallion (Clark 1955: 286); inner circle with "FOR BEAUTIFYING AND PRESERVING THE TEETH & GUMS" above "PREPARED BY JOHN GOSNELL & CO LONDON" an outer concentric circle with "CHERRY TOOTHPASTE" above "PATRONIZED BY THE QUEEN". 3 and 3/16 inches in diameter. Date according to Clarke 1955: 285; Praetzellis et al. 1979b: fig. 25d.	1846-1901

TABLE 10.14 (con't)

Manufacturer and Locality	Artifact Number	Description	Attributed Date
H. P. Wakelee San Francisco, California	C1-S-13	Printed with black over yellow, green and blue, overglaze line in gold gilding encircling the periphery. Center of the Victorian Royal Arms above "PHILICOME"; outer encircling rim of "H. P. WAKELEE DRUGGIST" above "SAN FRANCISCO". 3 and 1/8 inches in diameter. Victorian Royal Arms printed with yellow and black. Philicome in black, on green with blue stippled ground. Outer rim of black over blue ground.	1860+-1906

TABLE 10.15

CRUCIBLES AT N-5 ALIGNMENT

Manufacturer and Locality	Artifact Number	Description	Attributed Date
Small Size			
	N5-Z-300	Impressed. ". . .NG- M$^{cr}_{ie}$"PATEN" above "Fruelle S^{r} PARIS" above ". . .AYLOR & C^{ie}". 1 1/4 inches high, 2 1/12 inches in diameter, 1 1/8 inches base diameter.	?
	N5-Z-301	Impressed. ". . .UELLE S^{r} PARIS" above "I TAYLOR & C^{ie}" above "SAN FRANCISCO". 1 3/16 inches high, 2 2/16 inches in diameter, 1 6/16 inches base diameter.	
Large Size			
Battersea London, England	N5-U-159 N5-U-160 N5-U-161 N5-U-163 N5-U-238 N5-U-485 N5-U-486 N5-Z-315 N5-Z-393	Impressed. Placed below the spout "BATTERSEA" above "WORKS", space above "ENGLAND". Near base with an oval, "PATENT PLUMBAGO"; above a small rectangular filler device; above "BATTERSEA"; above "WORKS"; above "LONDON"; above "CRUCIBLE COMPANY". The top and bottom phrase are aligned along the arch of the oval. A large letter "F" is impressed between the top and oval marks (alignment varies). Also a large number "38" painted in black on the exterior.	?
	N5-EE-82	Also a large number "4" painted in black on the exterior.	
	N5-EE-83	Also a large number "5" painted in black on the exterior.	
	N5-EE-84	Also a large number "7" painted in black on the exterior.	
	N5-EE-85	Also a large number "8" painted in black on the exterior. Note: there is considerable variation in the size of lettering.	

TABLE 10.15 (con't)

Manufacturer and Locality	Artifact Number	Description	Attributed Date
Justinien Caire San Francisco, California	N5-O-51	Impressed. "JUSTININEN CAIRE" above "SAN FRANCISCO CAL" with a floating, not aligned number "8" above the logo. Note: the mark is oriented to be read when the crucible sits on the mouth, not the base.	1867-1906
	N5-U-484		
	N5-V-107		
	N5-V-109		
	N5-V-160		
	N5-V-161		1867-1906
	N5-EE-86		
Stonegate ?	N5-V-10	Impressed "STONEGATE. . ."	?
Fragments	N5-U-164 N5-U-487 N5-U-640 N5-U-641 N5-V-108 N5-V-163 N5-EE-87 N5-EE-92 N5-EE-93	Fragments of large size crucibles, no manufacturer or painted symbols present.	?

TABLE 10.16

CRUCIBLES AT CHANNEL ALIGNMENTS

Manufacturer and Locality	Artifact Number	Description	Attributed ate
Medium Size			
Battersea Works, England	C2-C-42	Impressed on base. "BATTERSEA WORKS" above "ENGLAND" arranged around the periphery of the base with a number "20" above "grms" placed in the center. 3 13/16" high, 2 15/16" in diameter, 1 14/16' base diameter.	?
	C2-C-45	Same as C2-C-42. Base fragment 1 14/16" base diameter.	
?	C2-H-12	Printed in black. Illegible around periphery with number "20" placed in the center. Also a large number "3" painted in brown on the exterior. 3 12/16" high, 3" in diameter, 1 3/4" base diameter.	?
	C2-C-43	No mark visible, similar construction to C2-H-12. Also a large number "74" painted in brown on exterior. 4 2/16" high, 3" diameter, 1 3/16" base diameter.	
	C2-C-44	No mark visible, similar construction to C2-H-12. Also large number "43" painted in brown in upper part of exterior. 3 11/16" high, 3 1+/16" diameter, 1 12/16" diameter.	
Large Size			
Battersea Morgan, England	C1-CC-1	Impressed on side below pouring spout. "BATTERSEA" above "ROUND" above space above a large letter "F" above a space above "MORGAN" above "ENGLAND" Also a large number "7" painted in black on the exterior 4 14/16" high, 3 1/16" diameter, 1 7/16" base diameter.	?
	C1-CC-2	Also a large number "5x" painted in black on the exterior, 4 13/16" high, 2 15/16" diameter, 1 7/8" base diameter.	

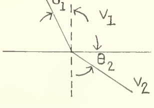
APPENDIX E

SEISMIC SENSING AT THE KING STREET SHIP SITE

Introduction

Small-scale seismic refraction methods are commonly used to obtain estimates of the physical soil properties and soil profile at a particular site. This data is applicable to many engineering problems involving foundation design, slope stability, or groundwater management. Because of the success of this geophysical technique in delineating velocity structure, it is possible that seismic refraction methods could be applied to archaeological exploration. Because it was believed that these methods might have application in the detection of nineteenth-century wooden ships buried within the landfill of the Embarcadero area of San Francisco, a small-scale hammer seismic refraction survey was performed for Archeo-Tec over a buried wooden ship unearthed during excavation of a sewer trench.

The seismic refraction technique is based upon Snell's law, which, (for a wave traveling across an interface from medium 1 into medium 2), is this:



$$\frac{\sin\theta_1}{V_1} = \frac{\sin\theta_2}{V_2}\text{, where}$$

V_1 = wave propagation velocity in medium 1

V_2 = wave propagation velocity in medium 2

θ_1 = angle of incidence of the raypath in medium 2 with the normal to the interface

θ_2 = angle of refractance of the raypath in medium 2 with the normal to the interface

A wave travels along the boundary of the two media when $\theta_2 = 90^\circ$, and it is the type of raypath (radiating energy back into medium 1) that yields most of the information obtained in a refraction traverse. Rearranging Snell's law, and letting $\theta_2 = 90^\circ$, gives:

$$\sin\theta_1 = {}^{V_1}/_{V_2}, \text{ or, } \theta_1 = \sin^{-1}\left[{}^{V_1}/_{V_2}\right]$$

From this last equation, if θ_1 is a real angle, then ${}^{V_1}/_{V_2} \leq 1$, or $V_1 \lessapprox V_2$. This result implies that critical refraction (when $\theta_2 = 90^\circ$) occurs only if the velocity in the second medium is greater than the velocity in the first medium. Thus, in geophysical practice, the seismic refraction technique is useful only in cases where the velocity increases with depth. The standard interpretation model used in refraction studies assumes that the geologic situations can be approximated using a finite number of constant velocity layers. For this interpretation scheme to be successful, the velocity of any particular layer must remain constant over the areal extent of the field site. In many geologic situations, the velocity will remain areally constant and will increase with depth, the necessary conditions for the application of refraction techniques.

Field site C-2 is located at the intersection of King Street and the Embarcadero in San Francisco. During excavation of a sewer line trench through this site, a wooden-hulled, nineteenth-century sailing ship was discovered buried within the landfill (see Figure E.01). A number of seismic refraction lines were recorded at site C-2 on June 16-17, 1979, in an attempt to detect the buried ship using this remote-sensing technique (see Figure E.02). The data was recorded on a Bison 1580 signal enhancement seismograph using a 10 lb. sledge hammer source and a single geophone. Arrival times were picked from the display screen of the seismograph, and the seismic waveforms were then plotted on a chart recorder for later interpretation. A brief description of each of the profile lines follows:

Line A-A'

A standard refraction line in which the geophone is positioned near stake A, and the source is moved in small steps toward stake A'.

This profile is then "reversed", so that the geophone is placed near A', and the source is moved toward A.

Line B-B'

A standard refraction profile between stakes B and B'. This profile is also "reversed".

Line C-C'

A standard refraction profile (also "reversed") between stakes C and C'. Because this profile runs directly over the keel line of the burried ship, each source location was repeated twice in order to obtain better arrival time and waveform data.

Line D-D'

Along this line the separation between the source and the geophone was fixed at 8 ft. This array was then moved from stake D toward stake D' in 4 foot increments. Arrival times and waveforms were recorded at each position. The arrival time data was used to estimate the variation of the surface layer velocity at site C-2. Changes in the seismic waveform might occur as the source-receiver array passes over the buried ship.

Observations of the hull of the buried vessel made during the excavation of the sewer trench suggested that the section of hull southeast of the trench has not been filled by sediment. If this is the case, then the "target" appears as a void in the earth. This geometry would be ill-suited for detection using seismic refraction techniques, as the velocity within the cavity is certainly less than the velocity of the surrounding landfill. However, the large impedance contrast between the cavity and the surrounding landfill should certainly reflect much of the energy radiated by the source back to the surface. Part of the interpretation of Lines C-C' and D-D' will determine if this reflected energy is present in the seismic waveform.

The following four sections will deal specifically with the analysis and interpretation of the four profile lines recorded in the field. The last section of this report will detail the conclusions of the field study and subsequent data interpretation.

Line A-A'

The primary purpose of recording Line A-A' was to provide an estimate of the velocity structure in an area removed from the presence of the buried vessel. Geophones were placed between stakes A and A' at a distance of 2 feet from either stake. The sledge hammer source was moved in 1- or 2-foot intervals from stake A toward A'. This traverse was then "reversed" by moving the source from A' to A in 1 or 2 foot intervals. This traverse was repeated two more times (with larger intervals between source locations) as a check on the repeatability of the data. For each source location the first arrival time was read from the seismograph, and the waveform permanently recorded.

Figure E.03, a graph showing the first arrival time plotted as a function of source-receiver separation, is the most common method of displaying seismic refraction data. Data points that fall on a straight line result from raypaths that travel predominantly through regions of the earth within which the propagation velocity remains relatively constant. In some cases it is possible to interpret refraction data (such as presented in Figure E.03) in terms of a layered earth model.

The data presented in Figure E.03 shows little agreement between the traverse recorded with the geophone at A, and the "reversed" profile recorded with the geophone at A'. In fact, the agreement is so poor that two more traverses of this line were performed, and this arrival time data is presented in Figure E.04. Figure E.03 and E.04 appear very similar, so that instrumentation error must be ruled out. The most likely explanation of this inconsisteny is that the coupling of the geophones to the earth was vastly different at locations A and A', and that this effect severely attenuated a low amplitude first arrival at geophone A'.

Very few conclusions (in terms of a layered earth model) can be drawn about the data presented in Figure E.03 and E.04. There is apparently a volume of high velocity (6060-17,800 ft/s) material located near Line A-A', but there is no simple method of calculating the exact position of this body. Velocities of 10,000 ft/s or more are typical of consolidated rock, whereas velocities of 1000-5000 ft/s are more typical of soil and landfill material. Because bedrock (the Franciscan formation) is beneath approximately 100 ft. of unconsolidated sediment at site C-2, it must be concluded that a concrete wall, roadbed, etc., is beneath the surface near Line A-A'. The data obtained in this traverse did not yield very satisfactory information about the velocity profile at site C-2, and it therefore became necessary to obtain this information from traverses at other locations.

LINE B-B'

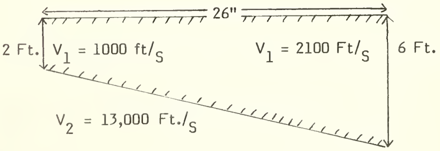
Traverse B-B' was performed north of the submerged ship and west of the trench. The primary purpose of this line was to test the velocity structure of the surroundings adjacent to the sunken hull.

A geophone was placed at point B', and the hammer source was placed along the traverse B-B' at two-foot intervals, for a total of 13 shot points along a 26-foot length. A reverse profile was then effected by placing the geophone at point B and the hammer source again actuated along the traverse at two-foot intervals. Arrival times for each source receiver setup were recorded and plotted in Figure E.05. A two layer model approximation was assumed and surface velocity (V_1) and underlying velocity (V_2) were computed for both a B to B' profile and a B' to B profile.

With the geophone at B, V_1 is calculated to be 2,100 ft/second and V_2 to be 8,900 ft/second. With the geophone at B', V_1 is calculated to be 1,000 ft/second and V_2 to be 17,000 ft/second.

It becomes readily apparent that we are dealing with geometry that cannot be readily modeled by a simple two-dimensional layered earth. For the upper layer, there is marked lateral increase in velocity as we traverse from B' to B. The underlying layer differences in velocity can be due to a sloping contact. A downward slope from B to B' would produce a lower apparent velocity on traverse B-B' than on traverse B'-B. Computation of estimated depth to underlying layer at region of point B is 5.9 feet and B' is 1.9 feet.

A rough model of the structure would be as follows:



An underlying velocity of 13,000 ft/second is extremely suspect. Such a velocity may be achieved in competent strata, but not in sediments and landfill. The depth to bedrock is on the order of 100 feet, so we have apparently located a large block of submerged concrete of similar material. A single traverse cannot affirm if the high velocity material is directly underneath or offset and askew with respect to a vertical plane passing through the profile. This region of high velocity cannot be due to the wooden hull or an interior cavity.

LINE C-C'

This profile has an azimuth of N86^{0}W which intersects the datum stake, so that this profile should run directly along the keel line of the buried ship. Geophones were located at stakes C and C', and a source was moved in equal 1-foot intervals from C to C'. The profile was then "reversed" by moving the source from C' to C by 1-foot intervals. Each source position was repeated twice to obtain an accurate arrival time and a sufficiently long waveform record.

The first arrival times are plotted as a function of source-receiver separation in Figure E.06. The most apparent feature of this data is that the surface layer velocity is much higher at the end of the profile line nearest stake C'. The velocity of this material is approximately 4800 ft/s, which leads one to believe that the C' end of Line C-C' lies on buried asphalt, or some other similar high velocity layer. Nearer the sewer trench (i.e., nearer stake C) the velocity of the material at this end of the line is much slower (2200 ft/s). This slower velocity fits more reasonably with the velocities expected in soil or landfill material. The arrival time data at large source-receiver separations can be explained in terms of the high-velocity layer beneath C'. A sketch of one possible geometry that is qualitatively compatible with the arrival time data is shown in at the top of Figure E.06. There is nothing in the arrival time data that suggests the presence of a buried ship. The predominant influence on the arrival time data is due to the high-velocity layer between C'.

It is reported that the hull of the buried ship southeast of the trench was observed to be hollow during the excavation of the sewer line. If the buried ship does indeed appear as a cavity, then attempts at using seismic refraction methods are useless (as a consequence of Snell's law). However, this cavity should reflect most of the down-going seismic energy back to the surface. By careful inspection of the seismic waveforms, it might be possible to detect this reflected energy.

Figure E.07 presents the waveform data recorded by the geophones located at C and C' for source-receiver separations of 2 feet to 24 feet. The traverse in which the geophone is located at C passes directly over the cavity, and any energy reflected from this cavity should appear on the waveforms recorded with this geophone. The traverse in which the geophone is located at C' should not pass over the cavity except at very large source-receiver separations, so the waveforms recorded by this geophone should contain no (expected) reflected energy. The most distinct difference between the two records occurs for source-receiver separations of 2 feet to 10 feet. In this region, the geophone at C has recorded waveforms with a higher frequency character beginning 5 to 6 msec into the record. The waveforms recorded by the geophone at C' do not show this high-frequency character, but instead show the low frequency, large amplitude Rayleigh wave typically found in this type of survey.

For small source-receiver separations, energy that is reflected from the cavity should take 5 to 6 msec to travel from source to receiver (assuming the cavity is buried 6 feet below the surface in a 2200 ft./s material). It is then possible that the high frequency event that occurs on the waveforms recorded at C might be energy reflected from the cavity. The distinct arrival of this high frequency event is hidden within the high-amplitude Rayleigh wave visible throughout these records. However, it is also possible that this high frequency arrival might be related to the cavity formed by the sewer trench, rather than the cavity formed by the ship's hollow hull. This is a more likely case because geophone C was inadvertently positioned over the sewer trench. The reflection point (mid-point between the source and receiver) lies within the region of the sewer trench for source locations up to 10 feet distant from geophone C. The high frequency energy seen on the records of geophone C might be due to energy reflected from the hollow ship hull, but is more likely that this energy has been reflected from the cavity formed by the sewer trench. However, it does appear that the presence of a buried cavity can be qualitatively detected using hammer source seismic techniques.

LINE D-D'

Standard refraction techniques are not suited to the detection of voids in a geologically noisy environment. Consequently, data on Line D-D' was gathered in an attempt to correlate changes in the character of the measured surface wave with the presence of the buried hollow ship. Due to a scaling error on the site map provided, Line D-D' was inadvertently placed on the vertical projection of the edge of the sewer trench. Consequently, any surface wave effects due to the presence of the hollow ship are probably masked by the effects created by the sewer trench.

An underground void, i.e., hollow ship, can be expected to increase the amplitude of the surface wave by an amount that is dependent upon the relationship between the depth of burial of the void and the fundamental wavelength of the surface wave. Surface waves propagating along any free surface decay exponentially with increasing distance from that surface. Thus the magnitude of the effect decreases exponentially with increasing depth of burial of the void. Calculations indicate that the wavelength of the surface wave is about 12 feet on the D side of Line D-D' and about 8 feet on the D' side of line D-D'. Assuming that the deck of the ship is approximately 6 feet deep, the exponential decay amounts to a factor of about 0.61 near D and about 0.47 near D'. These factors must be squared in order to account for decay in both directions between the surface and the ship's deck. Ideally, the surface wave returned from the deck can be expected to have an amplitude of roughly 25 to 35 percent of the surface wave. The top of the sewer trench is at a depth of about 3 feet. Thus, the surface wave returned from the sewer trench can be expected to have an amplitude of 47 to 60 percent of the surface wave. The proximity of the sewer trench to the surface results in a relatively strong surface wave effect and also prevents the transmission of the elastic wave energy farther into the subsurface.

As the arrival times for the direct wave between the hammer and the geophone indicate, there is a good degree of lateral inhomogeneity in the near surface properties along Line D-D'. Arrival times vary from a low of 1.32 msec. to a high of 2.96 msec. There is also a significant decrease in the average arrival time on the D' side of the 40 foot point. On the D side, the average first arrival time is 2.66 msec, while on the D' side the average first arrival time is 2.02 msec. The first arrival times are plotted on Figure E.08. A decrease in the first arrival time indicates an increase in the seismic wave velocity. The increase in velocity on the

D' side of Line D-D' is also indicated by an examination of the chart recorder traces, Figure E.09. The period-wavelength of the surface waves is markedly less on the D' side of Line D-D'.

The chart recorder traces reveal a number of possibilities for character changes of the surface wave. However, none of these can be uniquely assigned to the presence of the hollow ship. A signature such as that seen on the 50 msec. trace for the hammer point at 60 feet would be exemplary if it could be assigned to the presence of a void in the subsurface. However, the center line of the ship is at the 36-foot point on the Line D-D'. The 50 msec trace for the hammer point at 36 feet shows some apparent reinforcement of the surface wave; but this is also demonstrated for the hammer point at 24 feet, (the geophone is at 16 feet, which should be beyond the deck of the ship).

Surface wave effects may be pronounced enough to permit the detection of shallow subsurface voids. However, due to the improper location of Line D-D', it is impossible to determine the success or failure of a technique based upon surface wave effects from our data. Should the surface wave technique be shown to be ineffective in the detection of subsurface voids in geologically noisy environments, a properly designed and processed high resolution reflection survey could successfully delineate a subsurface void.

Summary

The site is laterally inhomogeneous to the extent that it cannot be represented by a simple geologic model consisting of horizontal or dipping plane homogeneous layers. The variability of the background structure makes the detection of a subsurface void using seismic methods very difficult.

The surface expression of this variability is indicated by the contour plot of the surface P-wave velocity given on Figure E.10. The surface P-wave velocity varies from a low of 1000 feet per second to a high of over 4000 feet per second over the site. A high velocity "layer" is detected beneath both Line A-A' and Line B-B' North West of the sewer line. The P-wave velocity of the "layer" is over 10,000 feet per second, and the "layer" is apparently at a greater depth beneath B than B', leading one to expect that it would extend to the other side of the sewer line. However, this high velocity material is not detected along Line C-C' to the South of the sewer line indicating that the subsurface is also laterally inhomogeneous.

Conclusions and Recommendations

We were unsuccessful in our attempt to detect the hollow ship's hull because relevant observations could not be assigned to the presence of a void without a high degree of ambiquity. The detection and delineation of subsurface voids using shallow seismic exploration techniques would require care even when the background geology is simple enough to be characterized as a series of plane horizontal or dipping layers. Under conditions of pronounced lateral inhomogeneity the detection of subsurface voids using shallow seismic exploration techniques is virtually impossible with standard methods. The success or failure of a surface wave technique cannot be determined from the data for Line D-D' due to its unplanned location over the edge of the sewer trench.

Standard methods do not yield sufficient information, and the collection and evaluation of the densely spaced reflection data required would be costly. A single 100 foot reflection survey line would require 10-15 man-hours in collection and an equal, if not greater, amount in evaluation. Ground radar is an alternative to shallow seismic exploration techniques that is worth some consideration for the detection of subsurface voids. Radar has been used successfully for the delineation of sink holes at depths of 10 to 20 feet below the ground surface, and it is probable that ground radar can be applied with equal success to the detection of other types of subsurface voids.

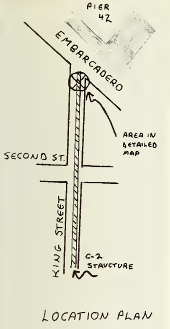


Figure E.01a

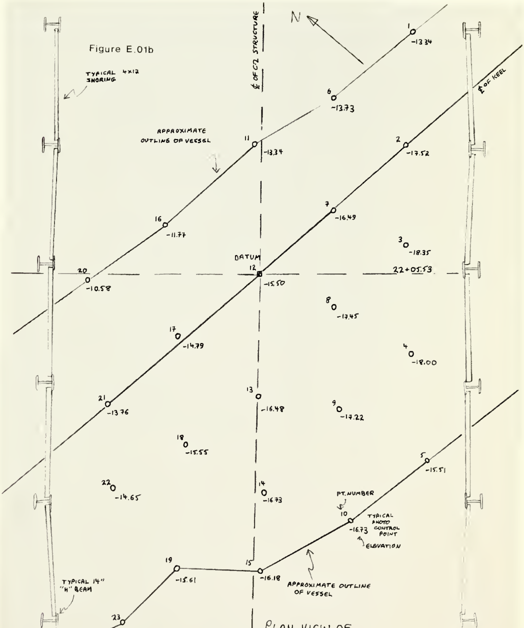
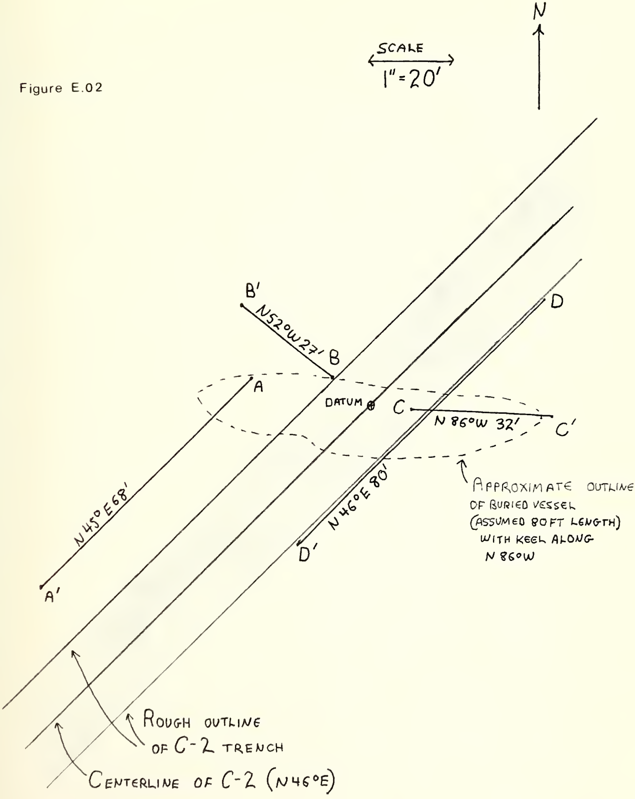


Figure E.01b

Figure E.02


N
SCALE
1" = 20'
B'
N52°W27'
B
A
DATUM ⊕
C
N 86°W 32'
C'
D
N45°E68'
A'
N46°E80'
D'
APPROXIMATE OUTLINE
OF BURIED VESSEL
(ASSUMED 80 FT LENGTH)
WITH KEEL ALONG
N 86°W
ROUGH OUTLINE
OF C-2 TRENCH
CENTERLINE OF C-2 (N46°E)

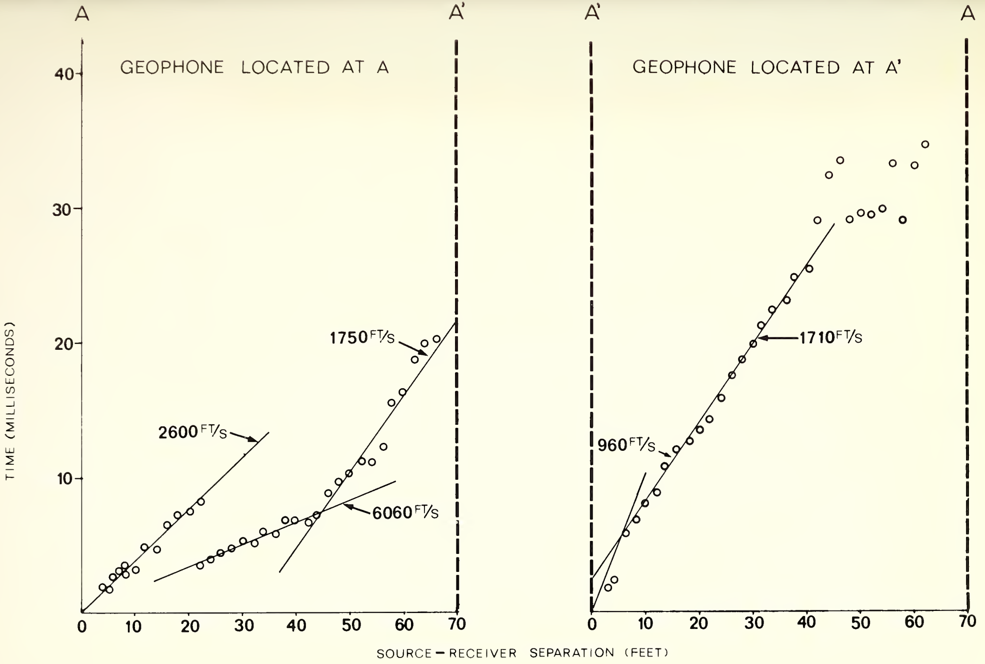

A
A'
A'
A
GEOPHONE LOCATED AT A
GEOPHONE LOCATED AT A'
40
30
20
10
TIME (MILLISECONDS)
1750 FT/S
2600 FT/S
6060 FT/S
1710 FT/S
960 FT/S
0
10
20
30
40
50
60
70
0
10
20
30
40
50
60
70
SOURCE — RECEIVER SEPARATION (FEET)

FIGURE E.03

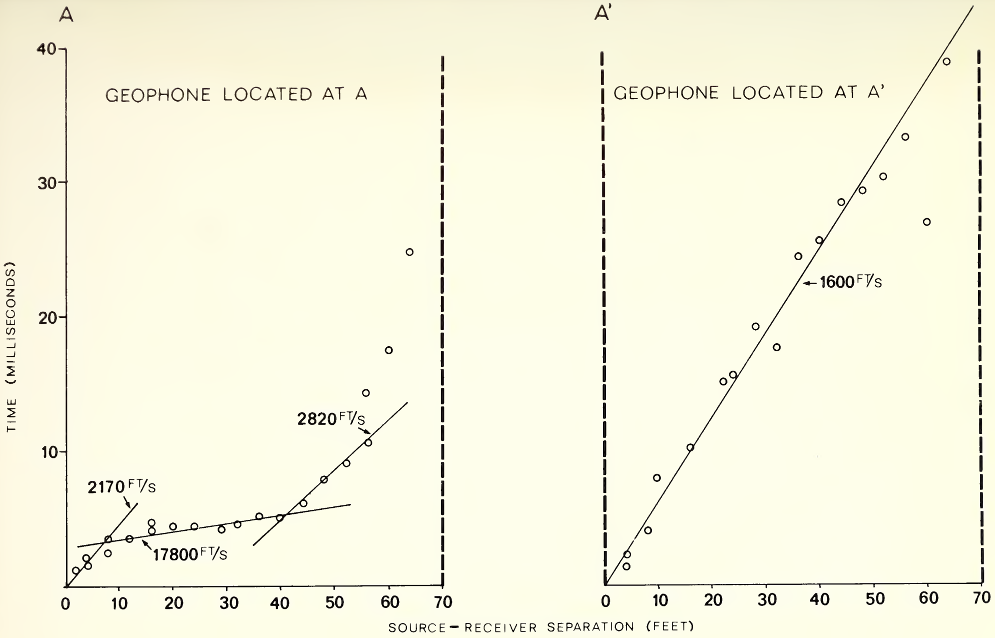

A
A'
GEOPHONE LOCATED AT A
GEOPHONE LOCATED AT A'
TIME (MILLISECONDS)
40
30
20
10
0
10
20
30
40
50
60
70
2170 FT/S
17800 FT/S
2820 FT/S
1600 FT/S
SOURCE — RECEIVER SEPARATION (FEET)

FIGURE E.04

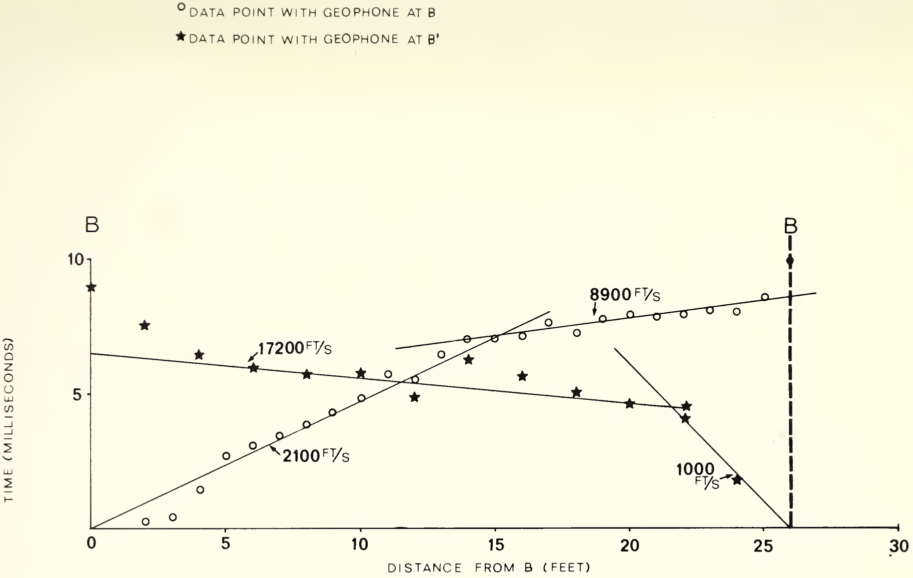

○ DATA POINT WITH GEOPHONE AT B
★ DATA POINT WITH GEOPHONE AT B'
B
B
10
5
TIME (MILLISECONDS)
0
5
10
15
20
25
30
DISTANCE FROM B (FEET)
17200 FT/S
2100 FT/S
8900 FT/S
1000 FT/S

FIGURE E.05

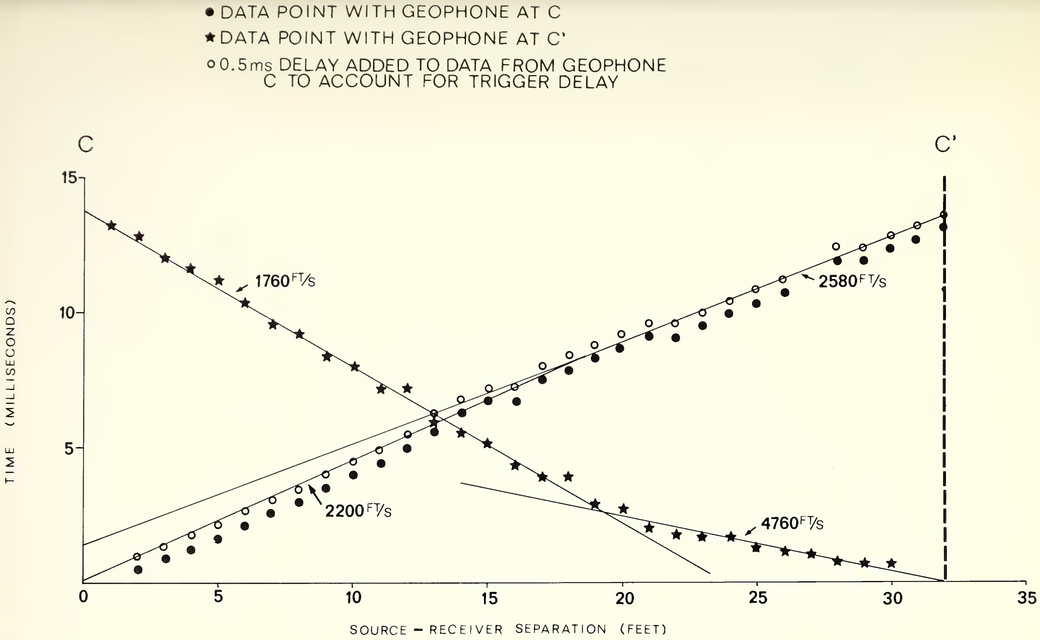
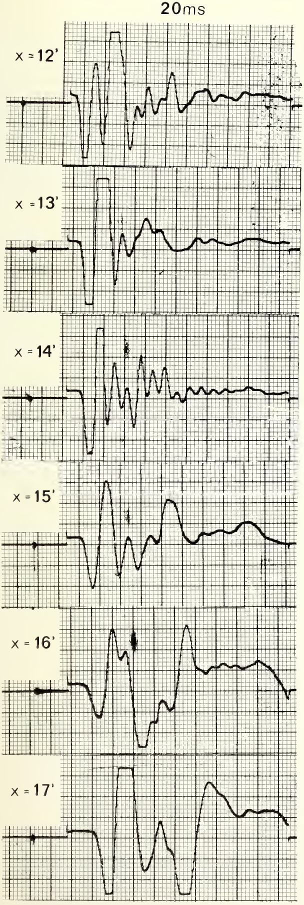

● DATA POINT WITH GEOPHONE AT C
★ DATA POINT WITH GEOPHONE AT C'
○ 0.5ms DELAY ADDED TO DATA FROM GEOPHONE C TO ACCOUNT FOR TRIGGER DELAY
C
C'
1760 FT/S
2580 FT/S
2200 FT/S
4760 FT/S
TIME (MILLISECONDS)
15
10
5
0
5
10
15
20
25
30
35
SOURCE – RECEIVER SEPARATION (FEET)

FIGURE E.06

FIGURE E.07
GEOPHONE AT C



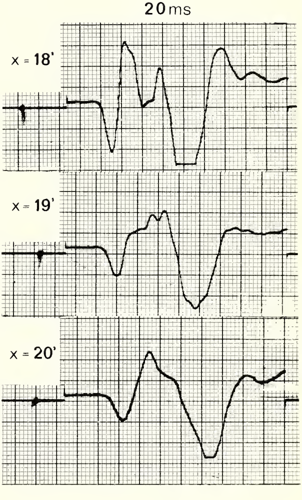


FIGURE E.07 (cont.)

GEOPHONE AT C'

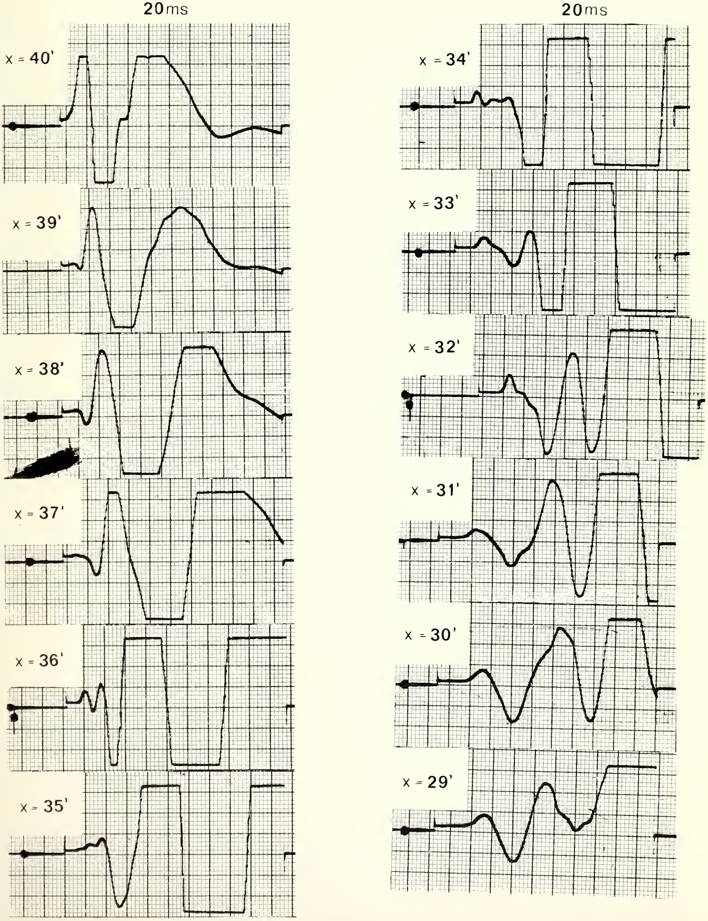
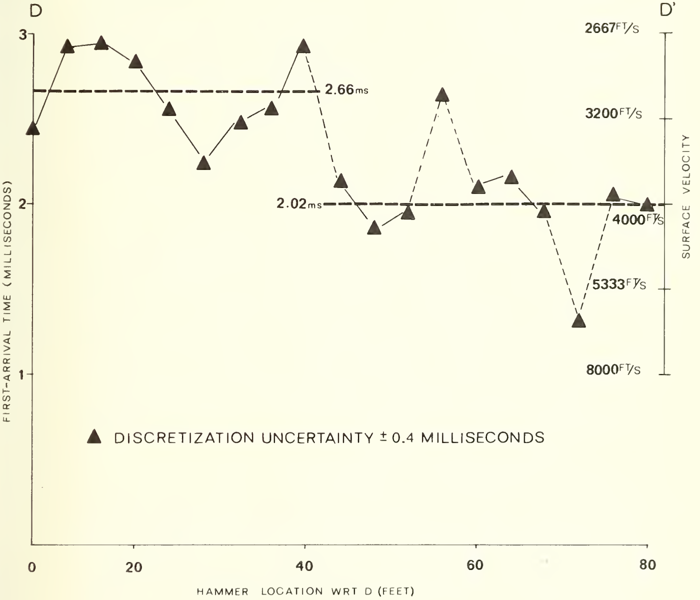


FIGURE E.08 ANOMALY HUNTER



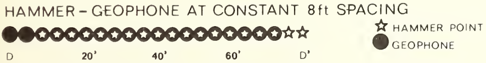
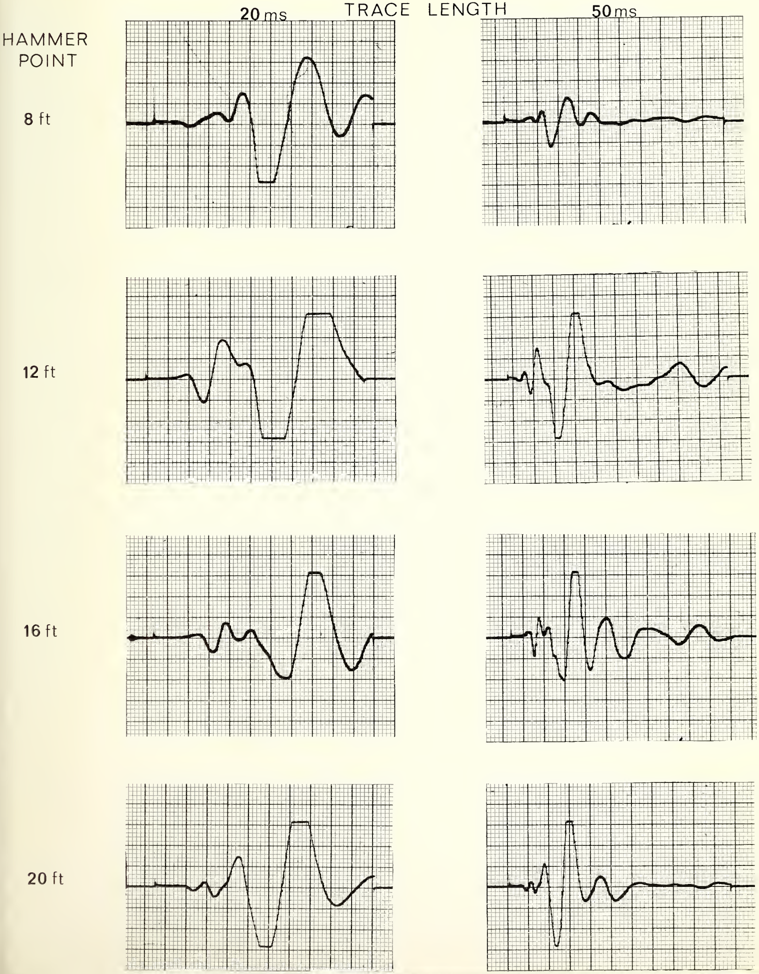
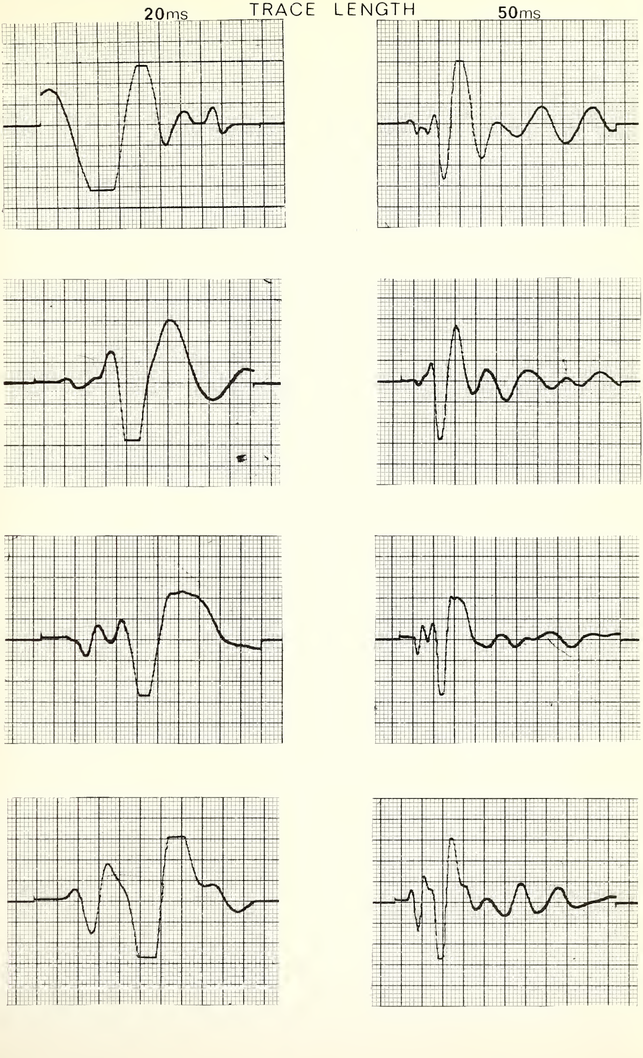


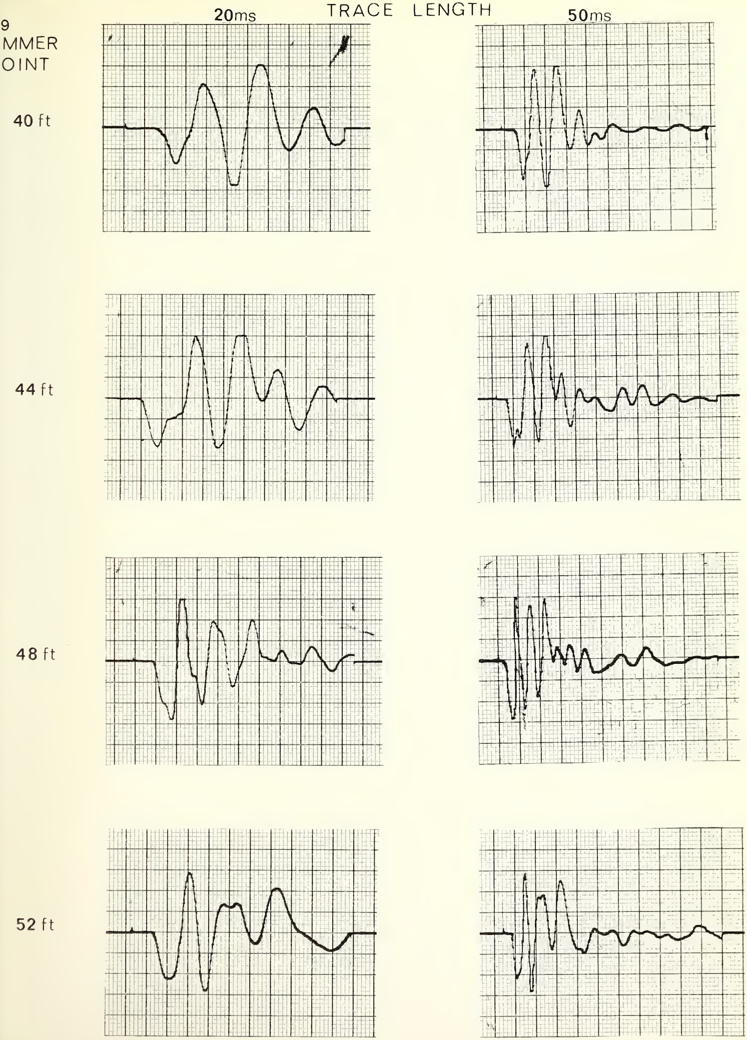
FIGURE E.09 LINE D - D'
HAMMER GEOPHONE SEPARATION 8 FT



E.09
HAMMER
POINT



E.09
HAMMER
POINT



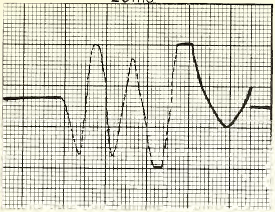
E.09
HAMMER
POINT

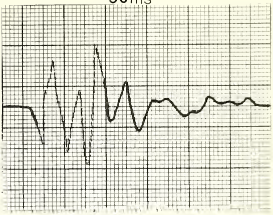
TRACE LENGTH

20ms

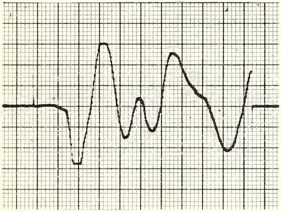
50ms

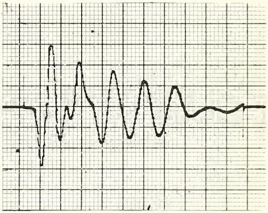
56 ft



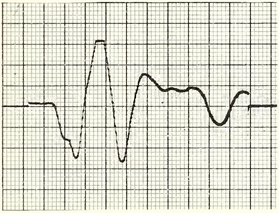


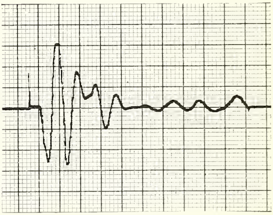
60 ft



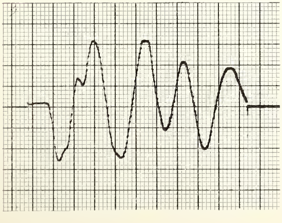


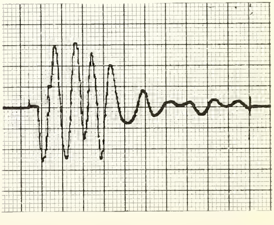
64 ft





68 ft





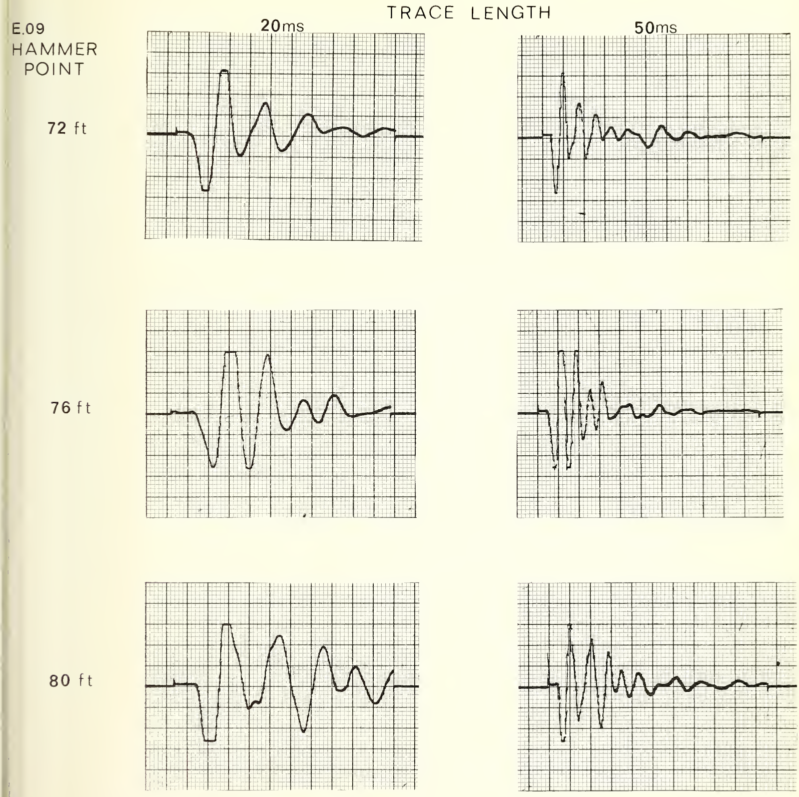
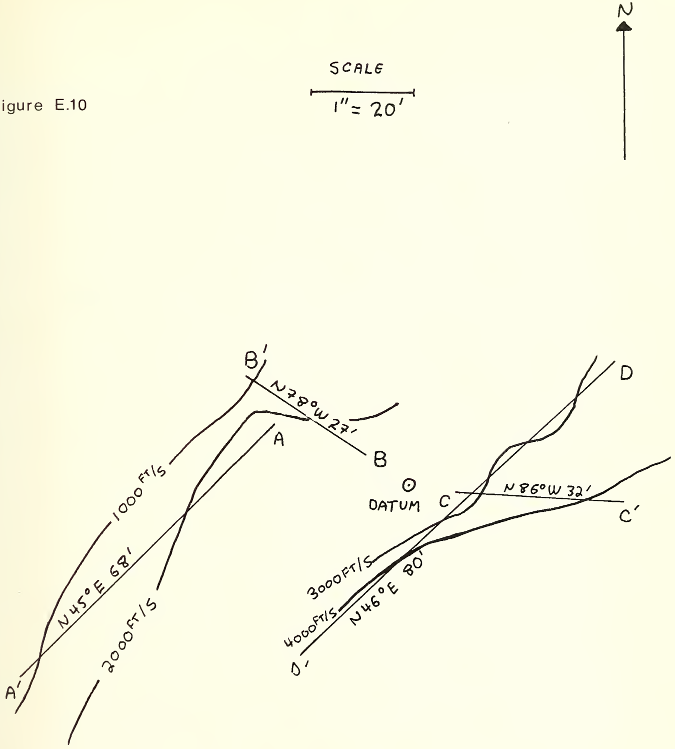
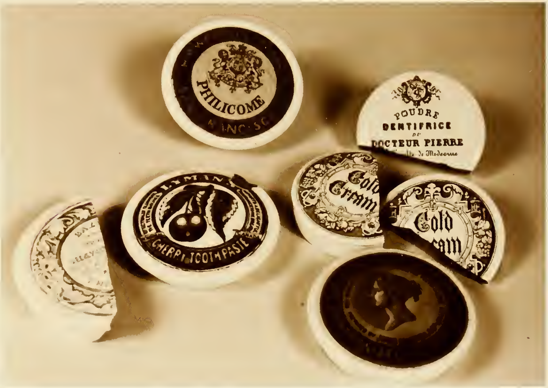

TRACE LENGTH
E.09
HAMMER
POINT
20ms
50ms
72 ft
76 ft
80 ft

Figure E.10



CONTOUR LINES OF SURFACE LAYER VELOCITY
(FEET/SECOND)

Prepared by Archeo-Tec, Oakland, California
For the San Francisco Clean Water Program



Front cover: Crews uncovered hundreds of nineteenth-century bottles in the landfill behind the seawall, including this cobalt blue, embossed glass Bay City Soda Water bottle dating to the early 1870s. (Eric McGuire)

Back cover: San Francisco pharmacists sold cold cream, toothpaste, and hair pomade in ceramic apothecary jars embellished with multicolor transfer-printed lids. They retain their beauty after a century-long rest in waterfront landfill. (Jack Prichett)

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